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ARCHITECTURE

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(Gelatine Print issued only with Imperial Edition.)
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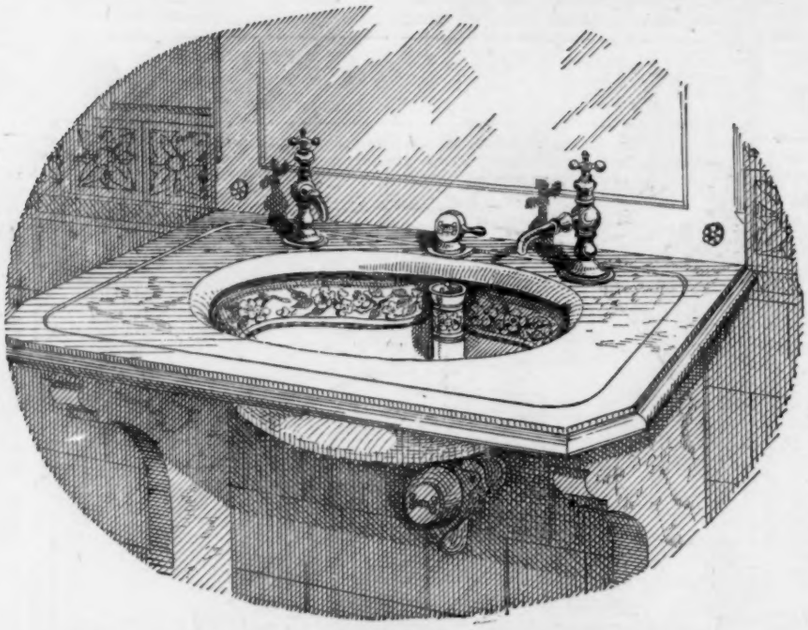
Proposed North River Bridge, N. Y.
Leicester Square, London, and the Statue of George I.
Statue of George I in its last state.
House, at Albany, N. Y.
Dr. Webb's Office, Shelburne, Vt.
Dining-room, Baltimore, Md.

THE SANITAS LAVATORIES.

(BASIN, BATH-TUB, PANTRY-SINK.)



THE SANITAS PATENT WASH-BASIN.

Quick emptying with a stand-pipe overflow. These fixtures discharge very rapidly, scouring the trap and waste-pipes. The overflow pipe stands in a recess in the back of the fixture, and does away with the ordinary foul secret overflow passage, and the troublesome and dirty plug and chain. A single motion of the hand opens or shuts the outlet. By this device the utmost simplicity, convenience, and cleanliness are obtained. The stand-pipe may be readily detached from the lifting device to facilitate burnishing or scrubbing. The Sanitas basin stand-pipe is made either of brass or earthenware. When made of earthenware like the basin itself all visible submerged metal work and consequent burnishing is avoided, and the stand-pipe admits of colored decoration like the basin itself, producing with the latter an ornamented effect altogether original and unsurpassed.

Ordinary lavatories have outlets so contracted that they discharge a stream in size scarcely a tenth of the capacity of their waste-pipes. The result is a gradual accumulation of filth therein and a highly unsanitary condition of affairs. No trap or even straight pipe, whether vented or unvented can be kept clean under such lavatories. The Sanitas Lavatories on the contrary fill the pipes "full-bore" and strongly scour them.

Beware of infringements which are inferior as well as illegal. Accept only the genuine and original standpipe lavatories which are stamped with the name "Sanitas."

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THE committee in charge asks us to draw attention to the competition announced in another column for the enlargement of the State House at Boston and we comply, with regret that the Commonwealth of Massachusetts should have such good cause to be ashamed of herself.

FIRE AND WATER calls attention to the increased risk from fire attending the use of the strong shutters and solid roofs now so commonly used on warehouses. At a recent fire in Australia the firemen found the shutters so securely fastened that the inside of the building, filled with valuable goods, was nearly burned out before they could get a stream of water into it. In a similar manner, at a fire in New York a week or so ago, the firemen, knowing that they could not get into the windows, climbed to the roof, and attempted to cut a hole through. They found that the roof was laid with brick and concrete, and it took so long to make an opening in it that the stock in the building was almost destroyed, and it was finally necessary to cut through the brick party-wall from the adjoining building in order to get a hose through. As a remedy for the bad effect of fortifying buildings so successfully against friends and foes alike, *Fire and Water* proposes that the practice common in Chicago, of leaving one shutter on each story unfastened, so that it can be opened from the outside, should be adopted in all large cities.

ARCHITECTS can undoubtedly do something toward assisting the introduction of the metal aluminium into common use. The present price of aluminium is about eight dollars a pound, or about one-half that of silver by weight, while as the specific gravity of aluminium is two and one-half, while that of silver is more than ten, one can exchange a piece of silver for one of aluminium eight times as large. For many purposes this would make the cost of an article of solid aluminium no larger than that of one of brass plated with silver, while the advantage would be all on the side of the former. Many years ago drawing instruments were occasionally made of aluminium, in place of German silver; although then very costly, they were so light to use, and so strong and handsome, that those who could afford them thought their money well invested. At present prices, the use of the aluminium should add only two or three dollars to the cost of an ordinary pocket case of instruments, and the interest on this outlay would be repaid many times over by the superior delicacy which would be possible in handling the lighter tools, the avoidance of much of the risk of blotting valuable drawings by the fall of heavy dividers from the fingers, and the lessening of the fatigue from which the hands of very busy draughtsmen sometimes suffer. Opera glasses are very commonly made of aluminium at present, for lightness in use, and drawing tools, which are in the fingers all day, have quite as much claim to be made light as an object only held for a few moments in the course of an evening. Besides articles for their own professional service, architects could think of many building appliances for which a white, strong metal, not subject to corrosion, is greatly needed. To say nothing of locks, keys, bolts, hooks, chains and other items of builders' hardware, the portions of plumbing apparatus now commonly formed of brass, plated with nickel or silver, would be very advantageously replaced with aluminium. The brass used for these purposes is soft and weak, while aluminium is nearly as strong as steel, and is much better in point of permanent beauty of appearance. As every one knows, silver-plating is soft, and soon wears off by polishing, while the fumes of a match, or even long exposure to the ordinary atmosphere of dwelling-houses, turns it black. Nickel plating, while harder, does not cling so tightly as silver, and sometimes peels off, while lemon-juice, or other acids, attack it energetically. There are people enough who can pay for the best material to be had, and are willing to do so, and who dislike extremely to see the basin-cocks in their houses turning black and yellow from corrosion and wear, or the bath-tubs and sinks showing red streaks of copper through the tinning. In one of the Vanderbilt houses there is said to be a bath-tub of solid silver, and we have known an order given for a pantry-sink of German silver, so as to avoid the unpleasant effects of wear. The cost of a pantry-sink stamped out of sheet aluminium would certainly be no more than of one cast in German silver, and would probably be very much less, while an aluminium bath would be inexpensive compared with one of silver, and would be better and handsomer.

THERE are many indications that the day of huge apartment-houses has gone by in New York, and, while people who like to live in flats will probably be able for a good many years to obtain pleasant and well-planned ones at a low rent, there will be few or no new ones built. The first blow at them was given by the State law limiting the height of dwelling-houses to eighty feet. As flats on Fifth or Madison Avenue were always the most attractive, and, in so fashionable a location, must be built high, in order to gain renting space enough on a given area of land to pay interest on the investment, the passage of the law put a stop immediately to the construction of the best and most desirable houses of the sort, and compelled those who wished to build them to find cheap land for the purpose. Many of them were still built, but the character fell off, and the reputation of the old ones suffered undeservedly from the defects of the new ones. Moreover, the supply of apartments in the region above Forty-second Street ran ahead of the demand, and tenants enough to fill them could not be had at any price. Several large houses, built with borrowed money by men without means enough to carry them through a period of depression, were sold under foreclosure and rented for anything they would bring, and the competition of these brought down the income from the others. Finally, the largest enterprise of the kind in New York came to grief, and the so-called Spanish Flats, which cost more than six million dollars to build, were sold at auction not long ago, and bid in by the mortgagee. These enormous structures, which were well planned and very pleasantly situated on the Park, were begun about eight years ago by Mr. Navarro, and were intended to furnish perfect dwellings for about one hundred and thirty families. Mr. Navarro's intention was to erect the buildings in his own name, and sell the apartments absolutely to those who wished to occupy them by means of trust-deeds and perpetual leases. In this way he expected to be able to build, one by one, the eight sections into which the structure was divided, reimbursing himself so rapidly by sales that he would not be obliged to keep a very large capital invested. A Home Club was formed of persons who wished to become proprietors, and many of the apartments were sold and paid for. Unfortunately, the original estimate of the cost of the whole building, two million dollars, turned out to be entirely inadequate, and long before the rough shell of the first four sections of the building, had been completed, the money intended for it had been spent. A million was borrowed on a first mortgage to finish the building, and, this proving insufficient, six hundred thousand more were borrowed on a second mortgage. All this was used up, and still the house was unfinished. No one else would lend any more money, and the second mortgagee, fearing lest he should lose the six hundred

thousand dollars he had already invested, advanced six hundred and fifty thousand more, and completed the building, ready for occupancy. It proved very popular, and the persons interested decided to build the second half, in the hope of making up by the profit on this for their losses on the other. This portion, including the Fifty-eighth Street sections, called the Granada, Salamanca, Valencia and Tolosa, was built in 1885, the second mortgagee, as before, advancing three hundred and fifty thousand dollars to complete it. For a time it proved profitable. The apartments rented readily, and the rents paid all expenses and interest on the mortgages. About two years ago, however, the general decline in apartment-house property affected it, and the rents failed to provide for the mortgage interest. The first mortgagees foreclosed, and, after a good deal of adjustment of claims, the whole property was recently sold to the second mortgagee. This sale cuts off all the rights of the original proprietors, who paid for their apartments as members of the Home Club, and the new owner, regardless of their certificates of perpetual tenancy, is said to be intending to compel them to pay rent, just as if they had no money invested in the buildings.

AN architect in Berlin has just received a criminal sentence on account of an error in judgment, by which the lives of workmen were lost. The architect in question, M. Hiller, had designed a hospital, with a terra-cotta cornice. The upper members of the cornice overhung considerably, and the problem of supporting it, which is always a serious one with projecting members of terra-cotta, was solved by laying an iron plate on the lower portion of the cornice, held down by bolts three feet long, placed six feet apart, near the back edge of the plate, and extending down into the backing of the cornice, which was composed of brickwork fourteen inches thick. The terra-cotta blocks for the upper portion of the cornice, which projected fifteen inches from the face of the wall, were delivered irregularly and were set in place as they arrived. Apparently, this prevented tying them properly together, for, before the cornice was finished, sixty feet of it gave way, carrying to the ground with it nine workmen, of whom eight were killed. It is hard to tell, without seeing the testimony, just how the blame was apportioned between the architect and the contractor, but both have been sentenced to six months' imprisonment.

A NEW and promising light has been invented and patented, which is likely to come into extensive use for contractors and others who have night work on their hands. The principle is something like that of the famous Lucigen, in which a jet of crude petroleum, driven in spray by compressed air, is made to give a light rivalling in intensity an electric arc-light, but steam is used instead of compressed air to drive the jet of oil spray. The apparatus, ready for use, consists of two cylinders, one containing oil and the other water. They are filled from the bottom, so that the air in the cylinders is compressed in the upper portion; or air may be forced in by a small condensing pump. When the lamp is to be used, the condensed air from the top of the cylinders is allowed to begin to escape through the jet, and the oil is then turned on. The spray of oil and air is lighted, and burns with a light equivalent to that of twenty-five hundred candles. Just above the flame is a coil of pipe, communicating with the water cylinder. As soon as this coil is hot, the water is turned on, and, passing through the hot coil, is vaporized, and enters the jet in place of the compressed air, which is then turned off. The steam serves to maintain the blast begun with compressed air, while it greatly increases the light, through its decomposition into oxygen and hydrogen, which assist the combustion of the oil. As there is no wick, no choking can take place with any kind of oil, and crude or refuse petroleum, or creosote from gas-wastes, can be burned, while the apparatus is portable, and the lamp can be lighted in a moment.

M. LAMOUROUX, a counsellor of the city of Paris, has written a curious report upon the movement of population in that city, the average rents in the various quarters, and other statistics. As the boundaries of Paris are very distinctly defined by the line of fortifications, it is particularly easy to collect reliable statistics of the kind there, and as the Parisians are never tired of studying their own town, a great deal of information is collected in that way. Two or three years ago an alarm was raised that the population of Paris was declining, and we believe that it did fall off about ten per cent within a few years. Whether this movement still continues seems to be now uncertain, but M. Lamouroux's figures certainly do not indicate that the city has begun a new career of prosperity. Although the rich foreigners flock to Paris as much as ever, the working people are deserting it, as is plainly shown by the tables of vacant tenements. In the whole city there are now eight hundred and six thousand, one hundred and eighty-seven dwellings, most of these being, of course, small suites of rooms in a large house. At the end of 1887, nearly forty-seven thousand of these, or almost six per cent, were vacant. In 1885, about thirty-three thousand were reported vacant by the police, so that the number of empty dwellings increased in two years by fourteen thousand. During 1886 and 1887 fifty-six hundred dwellings were demolished, and eighteen thousand new ones built, so that the number of dwellings added to the city in those two years was twelve thousand, four hundred; yet, if there had been no new houses built within the two years, the number of empty tenements would have been greater by about fifteen hundred in 1887 than it was in 1885. This would seem to show conclusively a diminution in population, especially as the tendency in all great cities at present is to crowd families together less, and to multiply the number of small, independent households. The official returns distinguish between dwellings renting for one hundred dollars a year or less and those which cost more, and it will probably surprise persons not familiar with the modest way in which the real Parisians live to learn that six hundred and twenty-two thousand, or more than three-fourths of the whole, belong to the former class, while it is in this class that the depopulation of the city is most marked, the number of vacant small flats having increased in two years from nineteen to thirty thousand, while the number of unoccupied tenements of more than one hundred dollars rental value increased in the same time only from fourteen to sixteen thousand.

IN connection with his report, M. Lamouroux gives a map, which *La Semaine des Constructeurs* reproduces, showing the present average rental value of a tenement in each quarter of Paris. The most expensive quarter is, as might be expected, the region along the Champs-Elysées, where the average rent of an apartment is eight hundred dollars a year. Next to this comes the Madeleine quarter, where the average between the rent of the splendid dwellings on the Boulevards and the shabby rookeries on the back streets is five hundred dollars a year; and the third is the territory about the Invalides, where the rents average about the same as in the quarter of the Madeleine. This last is the ancient aristocratic quarter of Paris, while the others are those affected by the foreign residents, and between these and the districts inhabited by the great mass of middle-class and working people there is a striking difference in rents. The cheapest place to live in all Paris is the quarter of the Maison Blanche, south of the Gobelins factory. Although this is by no means an unpleasant or inconvenient place, being almost the highest land in Paris, and connected by the Belt Railway and various omnibus and horse-car lines with the other portions of the city, the average rent of an apartment is only forty-three dollars a year, or not much more than one-twentieth the average rent in the "English quarter" around the Champs-Elysées. The next cheapest region is Charonne, near the cemetery of Père Lachaise, which is also on high ground, and affords tenements at an average price of forty-seven dollars a year. Dwellings averaging from sixty to seventy dollars a year can be had, or could be had in 1887, in the quarters of Grenelle and Necker, close to the Exposition buildings now in process of erection, and in various districts in the northeast part of the city; while for one hundred and fifty dollars a year one may have an apartment under the shadow of the Sainte Chapelle, or of the Sorbonne, or the School of Medicine, or the Polytechnic School, or the Hôtel Cluny, or the Law School, or the Hôtel de Ville, or almost any of the hospitals, according to taste. As to the style of living expected of a tenant in the various quarters, a curious indication is given in a supplementary table of statistics given by M. Lamouroux, which shows that the number of domestic servants kept varies about in proportion to the rent paid. In the district of La Maison Blanche in 1886, in one thousand households, each composed of not less than two persons, only twelve domestics were employed; while in the quarter of the Champs-Elysées, the same number of households, of the same minimum size, kept sixteen hundred and forty servants.

BUILDERS' HARDWARE.[1]—XIV.

SASH-FASTS.

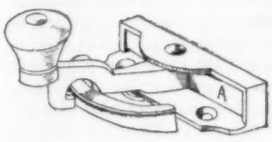

Fig. 183. Sash-fast. P. & F. Corbin.

THERE are so many varieties of sash-fasts to be considered, that, in order to make the descriptions less confusing, it will be well to classify the sash-fasts according to their most prominent characteristics.

I. *Old Style of plain lever-fast.* This consists of a plain, pivoted bar, attached to the upper sash, with a hook on the end, which works over a catch or raised plate on the lower sash. A knob, often of porcelain, is fastened to the end of the bar. Figure 183 illustrates this type. In the oldest makes of this kind, the lever was simply pivoted on the upper sash, and a knife-blade, slipped between the meeting-rails, could push the lever to one side and unlock the window without the slightest difficulty. In the sash-fast shown by the figure, the lever is made with a broad, flat end, which presses against a strong spring, *A*, at the back. The spring serves to stiffen the action of the lever, which is further protected against intrusion, in some cases, by dovetailing the bottom plates, so that the lever cannot be got at through the joint between the meeting-rails. Varieties of this same form are made with the lever swinging only half around in one direction, the gain thereby being that the back spring can be made longer and stiffer, without increasing the size of the sash-fast.

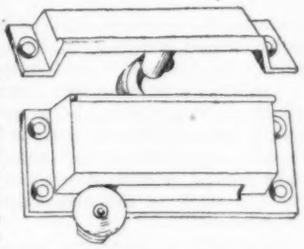

Fig. 184. Sash-fast. Russell & Erwin.

Figure 184 represents a variety of sash-fast, in which the lever is on the lower sash and hooks over an inverted peg on the upper sash. The "Judd" sash-fast, Figure 185, has a

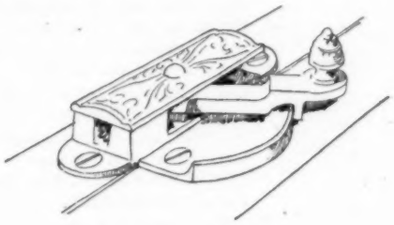

Fig. 185. Judd Sash-fast.

shoulder on the side of the lever so arranged that a knife-blade would catch on it and be broken before the lever could be moved sufficiently to open the window. Figure 186 shows a

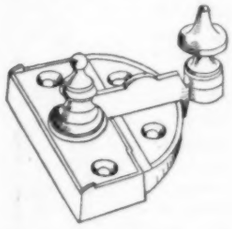

Fig. 186. Sash-fast. Norwich Lock Mfg. Co.

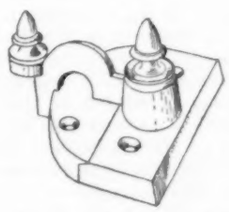

Fig. 187. Sash-fast. P. & F. Corbin.

strong form of sash-fast with no spring of any sort, but with a protection for the lever by dovetailing the plates together, as described in the previous paragraph; while the sash-fast, as indicated by Figure 187, works in exactly the same manner, but the plates are rebated together. Figure 188 is yet another variety, the plates here being not only dovetailed together, but also lipped down into the joint between the meeting-rails. The lever works in the same manner as the first sash-fast noticed.

[1] Continued from page 240, No. 674.

II. *Spring lever sash-fasts.* While some of the forms just described might be classed under this category, none of them actually have spring levers, as the springs are not so arranged as to force the lever open or shut from any position. Figure 189 shows what is known as the ordinary "Boston" sash-fast, which is used a great deal in Boston, and is much liked for its simplicity and sureness of action. This form is, apparently, made by almost every manufacturer of builders' hardware in the country. There is a coil spring around the hub of the lever tending to throw it back, and a simpler spring which bears against the ratchet connection at *A*, so as to lock the lever when it is closed. Hopkins & Dickinson manufacture a variety of this form, in which the spring-catch, *A*, has several cuts or ratchets on its edge, and the catch on the lever is bevelled, so that it will be held by any one of the ratchets. The advantage claimed for this is, that if the lever is drawn around hastily, it will be more likely to catch on the ratchets and be locked, than the ordinary pattern, which has but a single ratchet. This is known as the "Ladd" sash-fast.

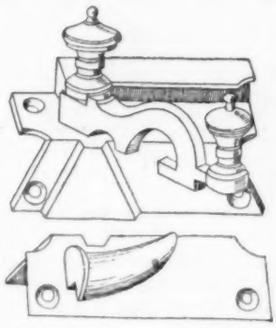

Fig. 188. Metropolitan Sash-fast. A. G. Newman.

The "Boston" sash-fast has to be set pretty carefully in order to be effective, and in the case of very excessive shrinkage, the space between the plates might be so reduced that the ratchet would not hold the lever. Such difficulties would, of course, arise only in a third-rate building. The form is believed by many of the

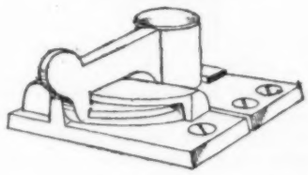

Fig. 189. Boston Pattern Sash-fast.

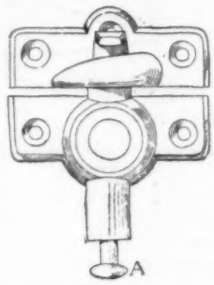

Fig. 190. Sash-fast. Hopkins & Dickinson Mfg. Co.

dealers to be the best in the market, and it surely answers very fully the requirements of a perfect sash-fast.

A scarcely less admirable sash-fast is shown by Figure 190. The lever is on the lower sash, hooking under a tooth on the upper sash, which is bevelled so as to draw the sashes more closely together. A strong spring about the axle of the lever tends to throw it open, while a small bolt, inside the lever, locks into a concealed catch on the post or axle of the lever. The bolt ends in a knob, *A*, and is fitted with a spring which keeps it pressed tightly towards the centre, so that the lever is caught and held when it is turned clear around through 90 degrees. On pulling the knob, *A*, the catch is released and the lever flies open.

Figure 191 illustrates a sash-fast which works in very nearly the same manner as the preceding, except that in order to release the lever the knob is pushed in. The Hopkins &

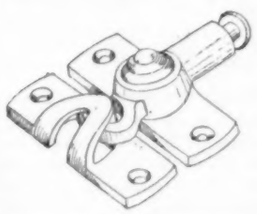

Fig. 191. Sash-fast. Stoddard Lock Co.

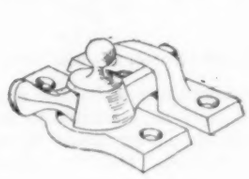

Fig. 192. Favorite Sash-fast. Reading Hardware Co.

Dickinson Manufacturing Company also has a sash-fast which hooks around a pin, like Figure 191, but is otherwise the same as Figure 190. P. & F. Corbin manufacture two forms of sash-fasts which are essentially the same as Figure 190.

III. *Lever sash-fasts with locking lever.* This includes

those in which the lever works without a spring, but is held either closed or open by means of an auxiliary lever. Figure 192 gives one variety of this kind, the lever being pulled down in order to permit the bolt to turn. The locking lever here is held in place by a spring, and catches into a slot in the bed-plate, preventing the lever from being turned. Figure 193

Fig. 193. Sash-fast. Yale & Towne Mfg. Co.

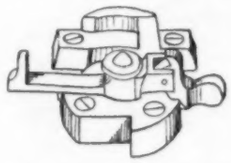

Fig. 194. Morris Sash-fast. Ireland Mfg. Co.

has a lever which works in the same manner as that of Figure 191, except that it has no spring. It is locked in place when turned, by a catch which is released by pressing the knob on top of the hub.

Figure 194 represents a form of sash-fast which has met with considerable favor, as being one of the first which had any right to the qualification of being burglar-proof. The action is perfectly simple. The lever is on the lower sash, and is held either open or shut by a smaller hinged lever which drops by gravity into the rebates of the bed-plate. Figure 195 shows a fast which operates in exactly the same manner, the

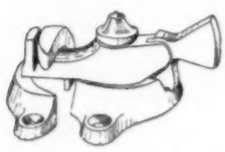

Fig. 195. Triumph Sash-fast. Ireland Mfg. Co.

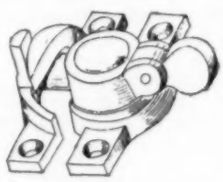

Fig. 196. Sash-fast. P. & F. Corbin.

smaller, gravity lever being raised to release the main lever; and Figure 196 is a type of a number of similar forms manufactured by P. & F. Corbin. The lever in this example is released by raising the secondary lever at the rear.

IV. *Locking lever sash-fasts.* This class includes those sash-fasts in which the lever locks itself when turned. Figure 197 is a form which has been on the market for some time, and

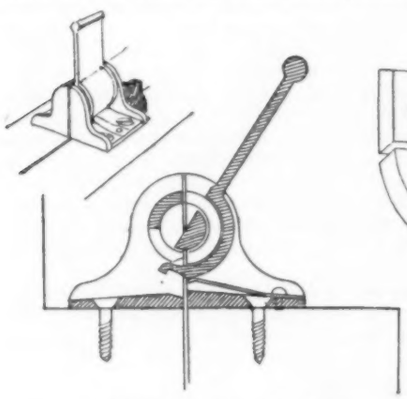

Fig. 198. Payson Sash-fast. J. B. Johnston.

Fig. 197. Mathes's Sash-fast. Nimick & Brittan.

is now comparatively little used, though the chief objection to it is only in reference to its size. It is as near to being absolutely burglar-proof as any form of sash-fast which has been devised. Half the axis, about which the lever is rotated, forms a part of the upper and of the lower sash portion of the fast. The figure shows the position when the sashes are locked, the lever hooking down under both half-axles, and not only drawing the two sashes together, but binding and holding them so they cannot be moved. To unlock the sash, the lever is thrown up to a vertical position.

The "Payson" sash-fast, Figure 198, is very simple and effective, ranking as one of the best in the market. The lever is on the top sash, and locks itself over the opposite post with the help of a small spring-bolt, the knob of which shows at the end of the lever. The attachment of the lever is such as to permit it to fold back on the upper sash. This sash-fast is not liable to get out of order, it draws the sashes together, and is as burglar-proof as would ordinarily be desirable. The only objection to it is that the connection between the lever and the locking-post does not allow for much shrinkage in the sash.

V. "*Cam*" *sash-fasts.* The sash-fasts of which Figure 199 is a type, are quite difficult to represent by a drawing. The action of the fast is as follows: The levers are fastened to the lower sash. When the upper lever is turned, the lower, or locking lever, is first thrown out until released from the hook on the upper sash, and then drawn around and in toward the hub, until both levers are on a line with the edge of the sash, the upper lever moving through 180 degrees, while the lower lever is moved only 90 degrees. Though the action sounds complicated, the sash-fast is perfectly simple in its construction, and there is nothing about it that can get out of order, or even wear loose, except by such excessive use as would practically never be given it in a house. There are no springs about it, consequently it has no automatic action, and in unlocking, care must be taken that the locking lever is turned clear around, as otherwise it will project beyond the meeting-rail and catch on the sash-muntins. This is really the only objection to it.

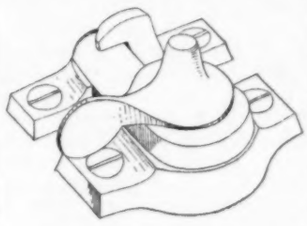

Fig. 199. Ives Sash-fast. H. B. Ives & Co.

Figure 200 is a very similar sash-fast manufactured by P. & F. Corbin. It differs only in the internal, eccentric arrangement. The Reading Hardware Company also manufactures a sash-fast very much like the "Ives."

VI. *Self-locking sash-fasts.* The "Boston" sash-fast flies open of itself, unless properly locked. Many people believe that a sash-fast should lock itself the moment the sash is drawn down, so as to leave no chances of the windows being unlocked, and, accordingly, there are in the market several varieties of self-closing sash-fasts. For general house use, it is believed, that such fasts would prove a great nuisance, as the window would, of course, have to be unlocked every time it was to be opened; besides, nearly all of these self-locking appliances are much more liable to get out of order, either through rust or neglect, than the ordinary sash-fasts; still, in some cases, there seems to be a necessity for them.

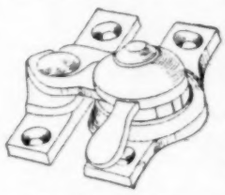

Fig. 200. Sash-fast. P. & F. Corbin.

Perhaps the simplest form of self-acting sash-fast is that illustrated by Figure 201. This consists of a spring bolt, acting not unlike the latch-bolt of an ordinary lock, which flies out whenever the sash is closed. It is mortised into one of the styles of the upper sash, or into the hanging-style, and the bolt bears on a plate on top of the meeting-rail of the lower sash. The figure shows one of the case-plates removed, to illustrate the construction. A very similar fast is shown by Figure 202. This, however, is not self-locking, as the top of the lever must be pressed in to force out the lower portion. Both of these appliances might almost be classed as sash-locks, instead of sash-fasts.

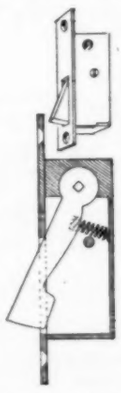

Fig. 201. Ticket-office Sash-lock. Enoch Robinson.

A self-locking fast of the description of Figure 201 has the disadvantage that the bolt must be held back when the window is to be raised, and, if the sash should bind, it is rather awkward to attempt to hold back the bolt with one hand and move the sash with the other. There is a device, the Security Self-locking Sash-fast, which obviates this difficulty, this consists of a bolt similar to that of Figure 201, but with a locking-lever which falls out when the bolt is pushed back. This holds the bolt flush with the sash and allows the sashes to be raised or lowered, but when the meeting-rails pass each other, the locking-lever is raised, releasing the bolt, which flies out as soon as the window is closed, thus locking the sashes.

Figure 203 is a self-locking sash-fast on a different principle. The cut shows the lower sash partly raised, the locking portion being attached to the upper sash. When the window is closed the hook, *D*, strikes against the catch, *C*, forcing it away from *B*, until, when the meeting-rails are on a level, *D* is hooked in between *C* and *B*. A spring at *A* keeps the two parts pressed against each other.

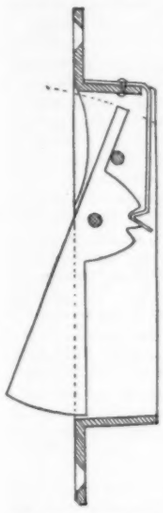

Fig. 202. Sash-fast. E. Robinson.

A very ingenious sash-fast, which works almost entirely by gravity, is shown by Figure 204. The cut shows it in the position it takes when the window is locked. The mechanism is attached to the upper sash. *A* is hung on each side to *B*, which hooks over the post on the lower sash. To open the window, the thumb is placed under *B* and the forefinger on top of *A*. Both pieces are lifted together until *B* assumes a vertical position, and *A* catches over the hook *C*. The sash can then be opened freely. On closing the window, however, the lower rail strikes against a hidden lever or cam at the back of *A*, lifting it from its hold on *C*, so the piece *B* can descend to hook in the position shown by the figure. The only spring used is one which pushes out *B* when *A* is released. This sash-fast is very nicely made, and is about as good a self-locking form as is in the market. It has an added advantage in that it locks itself before the sash is entirely closed, the post, *C*, being double notched on the face so that *A* will slip down and

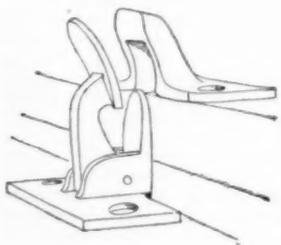

Fig. 203. Shaw's Sash-fast. Nichols & Bellamy Agents.

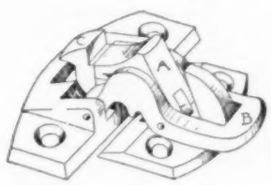

Fig. 204. Davis Sash-fast. Sise, Gibson & Co.

wedge the hook *B* when the window is within about a quarter of an inch of being closed. It will be observed that the locking is effected entirely by the piece *A*. *B* is brought over the

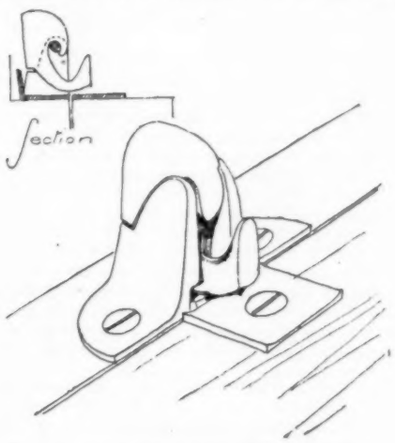

Fig. 205. Byam's Sash-fast. Byam, Stewart & Baker.

hook on the lower sash merely in order to draw the meeting-rails more closely together.

The "Byam" sash-fast, Figure 205, is a very simple device acting entirely by gravity, the central bent lever being so counterbalanced that the lower arm will always project over the lower sash. The section will show how this lever is hung.

VII. *Sash-fasts which lock in different positions.* The difficulty with all sash-fasts of this description is that, of necessity, they operate on one side of the window, instead of in the centre of the meeting-rail, and that, consequently, every attempt to open the window when it is locked, wrenches the sash so as to, in time, make it loose in the joints. Also, with nearly all the forms, the mechanism is concealed, so that the sashes are liable to many unnecessary wrenches. The advantages are that the window can be left partly open and still be secured from intrusion, and that, in most cases, either sash can be locked independently of the other.

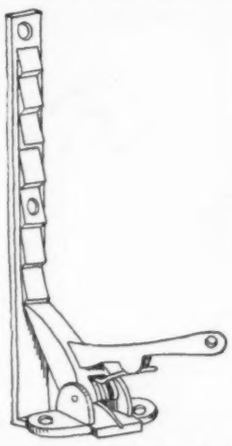

Fig. 206. Sash-fastening. J. B. Shannon & Sons.

Figure 206 illustrates a very primitive appliance, consisting simply of a ratchet rail, with a spring-catch on the bottom sash. Figure 207 shows a more complete form, which is mortised into the face of the hanging-style, the levers working into holes in each sash. The sashes are fitted with other holes on the edges, at intervals, so that they can be locked at various heights. In the cut the section shows more clearly the working. A single spring, coiled about each lever, serves to throw them

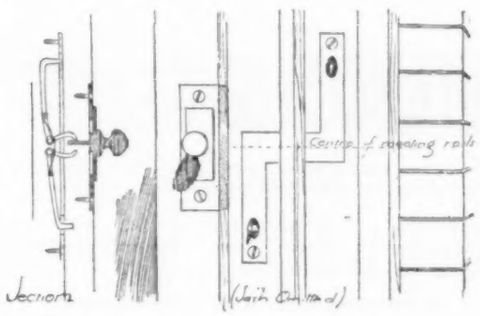

Fig. 207. Timby Sash-fast. Jenkins & Timby.

both out. Pushing up the knob on the inside bead draws back the upper lever, releasing the upper sash. Pushing the knob down releases in the same manner the lower sash.

Figure 208 represents the Attwell sash-fast, which differs

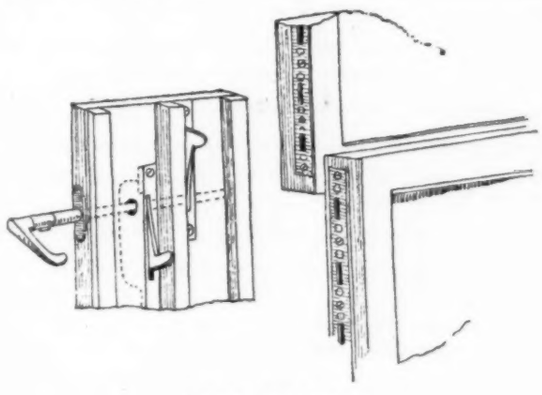

Fig. 208. Atwell Sash-fast.

from the foregoing chiefly in that the levers are worked by a single spindle, coming through the window-frame onto the face of the finish, and so arranged that when the spindle crank is turned up, the upper lever is drawn back without moving the lower, and *vice versa*.

There are a few forms of sash-fasts which will hold the window in any position. Figure 209 is a very common form, consisting of an excentric cam which screws to the face of the sash and wedges against the stop-bead, holding the sash by friction.

Figure 210 and Figure 211 are used chiefly for car work, the former acting in the same manner as Figure 209, while the latter works into slots in the jamb.

The sash-fasts thus far considered include all the principal forms commonly known to the hardware trade, as well as types

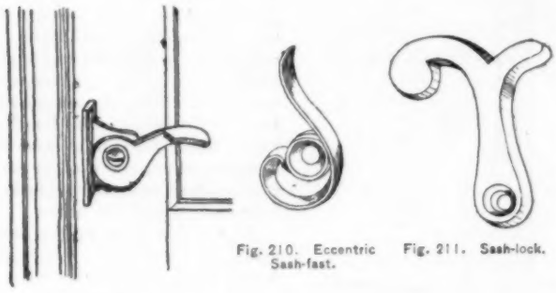

Fig. 210. Eccentric Sash-fast. Fig. 211. Sash-lock.

Fig. 209. Brown's Window-lock. S. A. Brown.

of many styles which have only limited sales. It would be impracticable to attempt an enumeration of all the sash-fasts which have been put on the market throughout the country, nor would any such list be of great value. The forms discussed and illustrated, will, it is believed, serve every purpose of comparison, and will enable the retail buyer to select to advantage, and to know the worth of what he is choosing from.

[To be continued.]

THE ILLUSTRATIONS

[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

HOUSES OF DR. J. J. MINOT AND DR. RUSSELL STURGIS, MARLBOROUGH STREET, BOSTON, MASS. MESSRS. STURGIS & BRIGHAM, ARCHITECTS, BOSTON, MASS.

[Gelatine print, issued only with the Imperial Edition.]

ADMINISTRATION BUILDING OF THE SOLWAY PROCESS CO., SYRACUSE, N. Y. MR. DOUGLAS SMYTH, ARCHITECT, NEW YORK, N. Y.

THIS building is almost completed; it is 44′ x 114′ and cost about $30,000. It is an administration building for a large concern manufacturing soda ash and includes offices, laboratories, draughting and photographing rooms. It is built of native or local buff brick, limestone and Perth Amboy terra-cotta.

THE PROPOSED NORTH RIVER BRIDGE. DESIGNED BY MR. GUSTAV LINDENTHAL, ENGINEER, PITTSBURGH, PA.

FOR description see article elsewhere in this issue.

LEICESTER SQUARE, LONDON, AND THE STATUE OF GEORGE I.

THIS illustration is reproduced from Thornbury and Welford's "*Old and New London.*"

THE STATUE OF GEORGE I IN ITS LAST STATE.

THIS illustration is reproduced from the *London Illustrated News.*

HOUSE OF JAMES F. BOYD, ESQ., ALBANY, N. Y. MR. W. H. MILLER, ARCHITECT, ITHACA, N. Y.

DINING-ROOM IN HOUSE OF H. MUNNIKHUYSEN, ESQ., BALTIMORE, MD. MR. C. E. CASSELL, ARCHITECT, BALTIMORE, MD.

DR. WEBB'S OFFICE, SHELBURNE, VT. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

IN demolishing an old building in Stockton for the purpose of erecting a new one it was found that the foundation rested upon the hull of a vessel, which, upon investigation, proved to be the Peruvian brigantine "*Adelaide,*" 300 tons burden. She was anchored at her present resting place in 1850, and now lies several blocks from the water. — *San Francisco Call.*

THE PROPOSED NORTH RIVER BRIDGE AT NEW YORK CITY.

IT is presumed, that every one is aware of the present antiquated manner of landing passengers in New York City, from any of the railroads now terminating on the New Jersey side of the Hudson or North Rivers. There is annoyance, and even danger, to the landed passengers on the overcrowded and nasty streets, and the demand for better facilities has repeatedly and urgently been made.

It has led to the attempt of tunnelling underneath the river, but the difficulties were found to be great, and it is obvious that two tunnels, such as proposed, would not accommodate more than, perhaps, one railroad. It is estimated that, at least, ten tunnels would be needed to meet the present demand alone, to say nothing of the future growth of the traffic. The reason for it is that the trains through such tunnels would necessarily have to be short, and have to run slowly for the sake of safety, because heavy grades are unavoidable to reach the safe depth under the bottom of the river.

The tunnels would, however, be very convenient for the local traffic, by means of cable cars, between Jersey City and lower New York City. The obstacles to the construction of a bridge across the North River seemed insurmountable. The only kind of a bridge thought of was one with piers in the river. The foundations to rock would be very deep, nearly 200 feet, but the greatest objection was that such piers would greatly damage the large, and steadily increasing commerce over the most magnificent river highway in the United States.

It is true that some fifty or sixty years ago an enterprising and remarkably ingenious builder proposed a wooden bridge in one span over the North River; but this project, described in quaint verse, is more remarkable for boldness of thought than for practicability.

The first one to propose to bridge the North River, at New York City, in one single span, and to present fully worked-out plans, is Mr. Gustav Lindenthal, Bridge-Engineer, in Pittsburgh, Pa. He addressed the American Society of Civil Engineers, last winter, in a paper on the subject, and showed on that occasion how he had arrived at his design by the process of selection and exclusion from a number of designs made for the purpose. Together, with a description of the details of the colossal structure, he presented a discussion of long-span bridge systems in general, from which it appeared that the so popularly assumed merits of cantilever bridges for long-spans are more than doubtful, and that they are certain of being superseded by better and stronger construction, as soon as their grave faults become more generally understood.

The matter of realizing Mr. Lindenthal's plans has since been taken in hand by a number of prominent capitalists, who have applied to Congress for the required legislation, and who hold out every promise of building the great bridge and the necessary approaches, together with the terminal stations at both ends, so that all railroads may use it on equal terms.

The importance of this enterprise, its benefits and far-reaching consequences to the city of New York and vicinity, can hardly be over-estimated.

The bridge is designed for six tracks, but will be built to carry four additional tracks, or, ten in all, should it become necessary.

Another bridge over the North River, at New York, should never become necessary, and should never be built. Only a fraction of the combined capital required for a number of double-track bridges will build a single structure, stronger and more enduring for the same number of tracks. For instance, a double-track bridge in one single span, over the North River, is estimated to cost $9,000,000 for construction alone, while a bridge, capable of carrying six tracks, is estimated to cost $15,000,000; and one million dollars additional will provide for four more tracks or in all, ten tracks, on the same structure. Five single bridges for double tracks would therefore cost about $45,000,000 for construction alone, without the approaches, stations, and without right-of-way. This will show the economy as well as the necessity of providing one bridge large enough for all present and future needs, and one station for all the western roads, coming into New York.

The number of trains which can be run on ten tracks onto Manhattan Island will be about the limit for which terminal facilities can yet be provided, without absolutely destroying the most valuable business quarters in New York City.

Careful investigation and estimates show, that a bridge of the same strength and capacity and for the same trackage, but with a pier in the middle of the river would cost not less, on the contrary slightly more, than a single span-bridge. This is principally on account of the great depth to rock for such a pier, which has to be of a certain size for a safe bridge intended for fast trains.

Therefore the obstruction of the river with a pier could not be justified even on the ground of the smaller cost of such a bridge.

The construction of the proposed bridge, gigantic and unprece-

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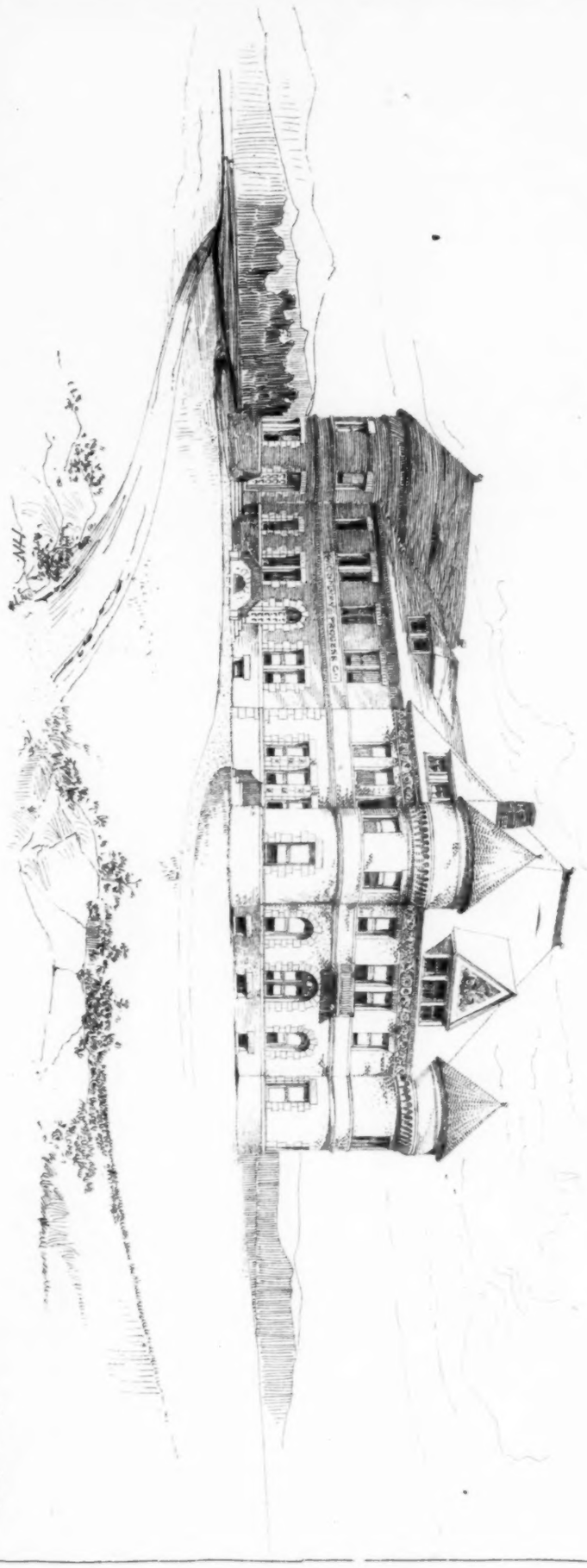

THE SOLVAY PROCESS CO.'S
ADMINISTRATION BUILDING
SYRACUSE, N.Y.
DOUGLAS SMYTH, ARCHITECT
NEW YORK.

Douglas Smyth Arch't.

Ticknor Printing Co. Boston

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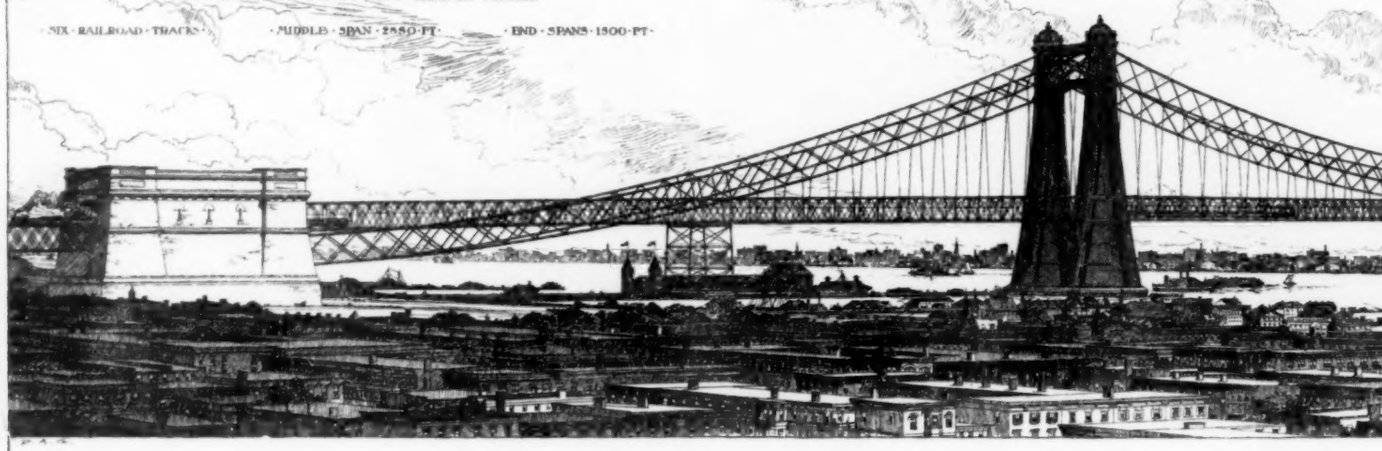
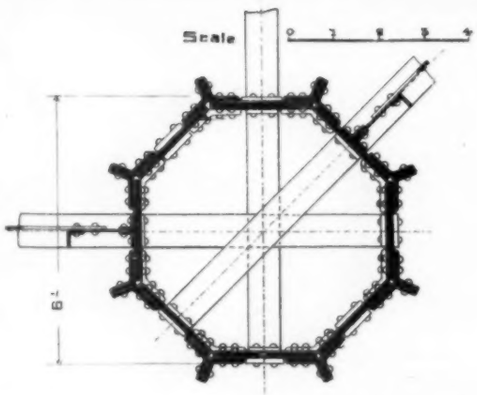
THE NORTH RIVER RAILROAD BRIDGE

PROPOSED AT NEW YORK CITY

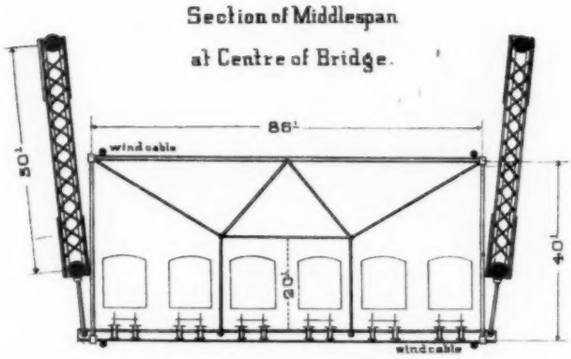
VIEW LOOKING FROM NEW JERSEY SHORE

SIX RAILROAD TRACKS — MIDDLE SPAN 2550 FT. — END SPANS 1500 FT.



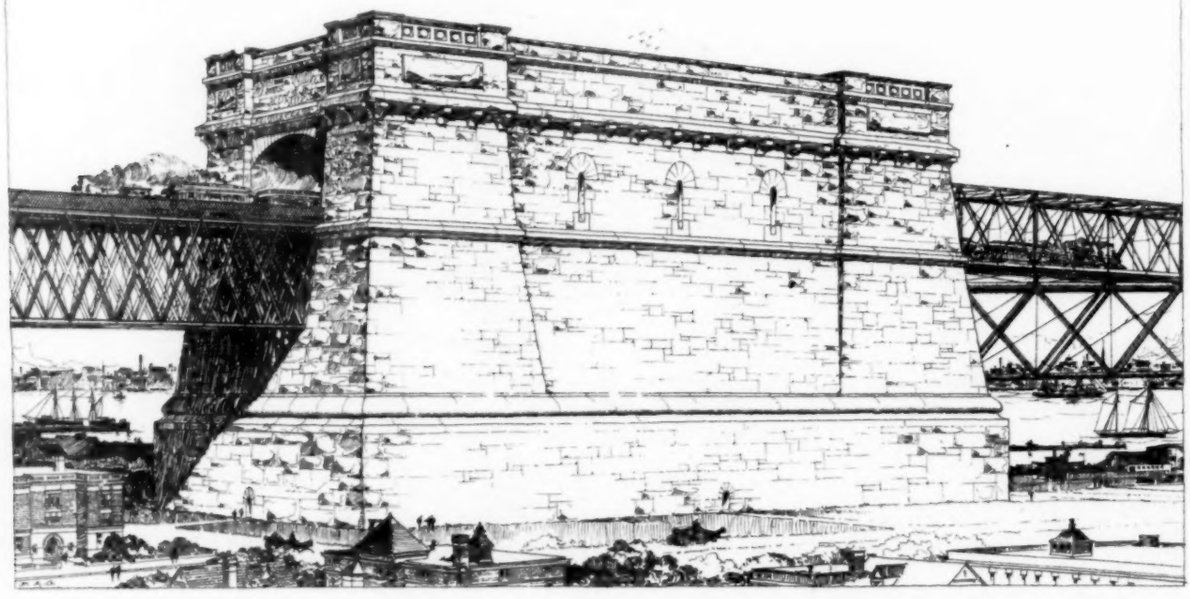


Section of one Tower-Column.

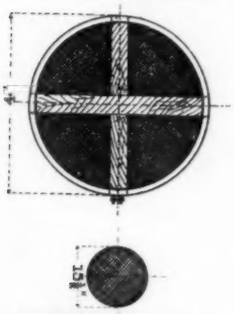


Section of Middlespan at Centre of Bridge.

ANCHORAGE ON NEW JERSEY SHORE



Section of Cable



Cable for East River Bridge on same Scale.

TOP OF TOWER

DESIGNED BY

GUSTAV LINDENTHAL

CONSULTING ENGINEER

PITTSBURGH PA.

AND NEW YORK CITY

Heliotype Printing Co. Boston

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LEICESTER SQUARE, ABOUT 1750.

Heliotype Printing Co. Boston.

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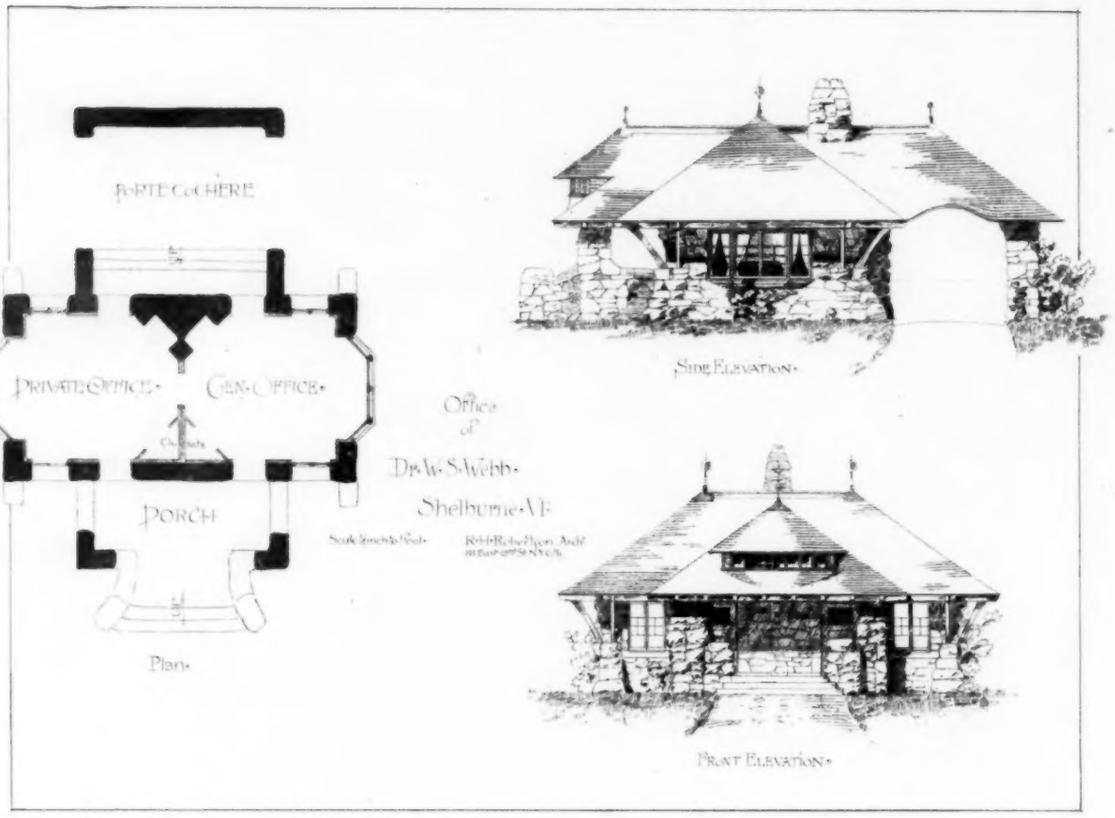

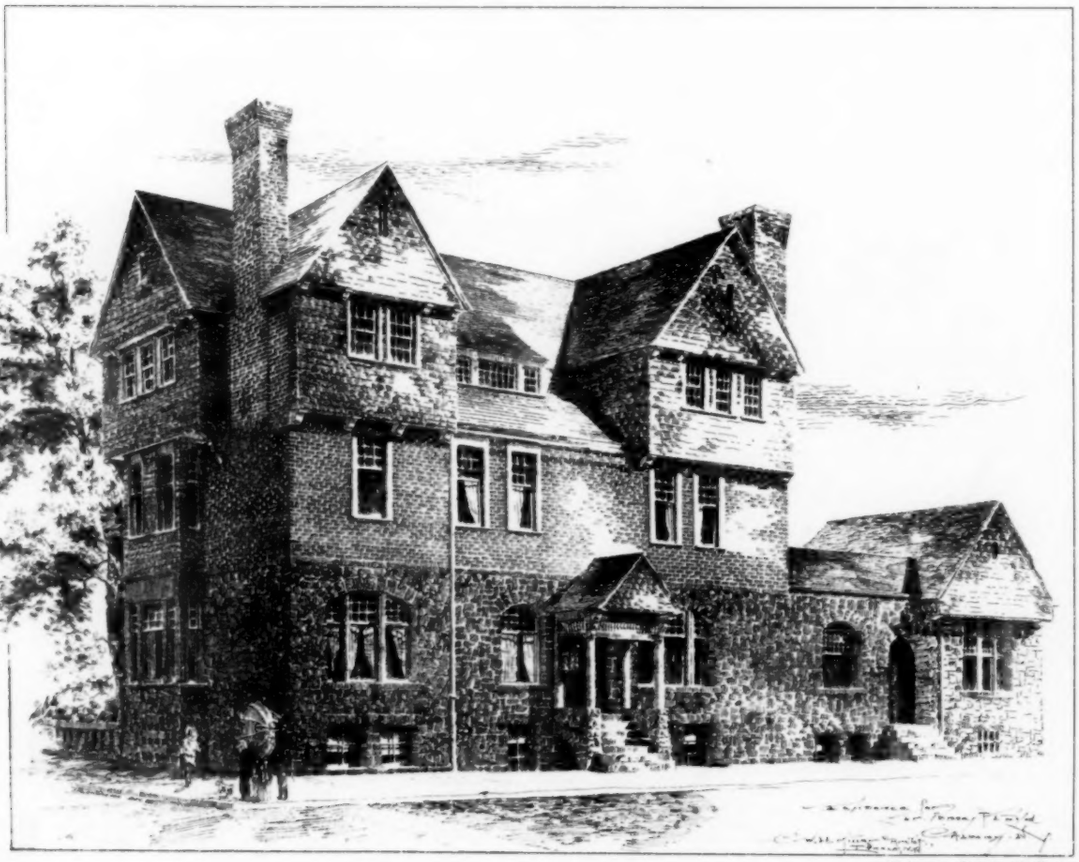

Heliotype Printing Co. Boston

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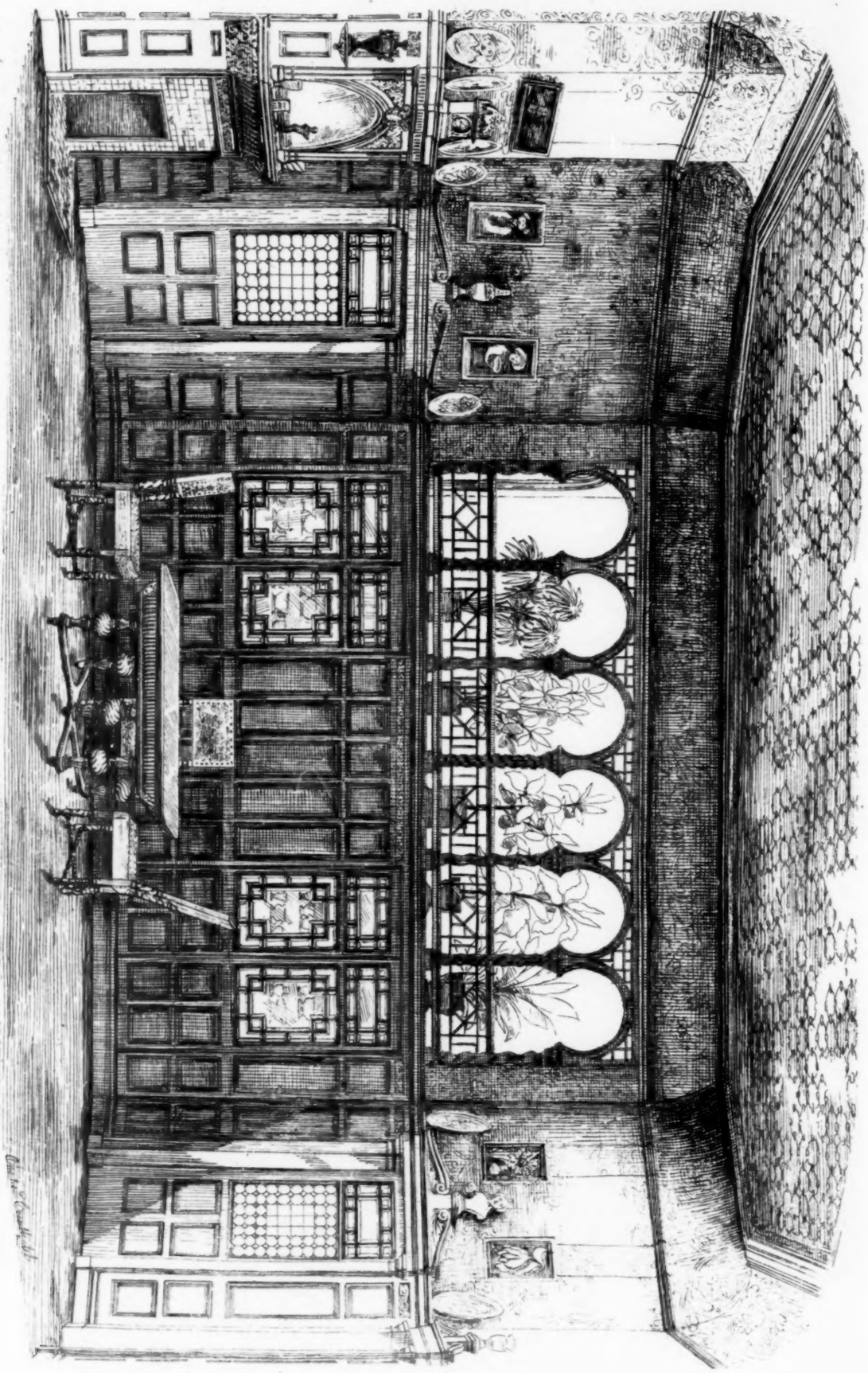

Charles C. Cassell, Architect
Baltimore, Md.

Dining Room in Residence of Howard Murray, Esq.

Bierstadt Lithog. Co. Boston.

dented as are its proportions, is considered by all competent engineers a matter of much less relative difficulty than was the construction, at the time, of either the East River Bridge or of the St. Louis Bridge. In such a degree have the manufacturing and constructive facilities of the country improved and increased, that the cost of the proposed bridge will be only little more than one-half of what it would have cost twelve years ago.

Mr. Lindenthal's plans are worked-out not only for the bridge, but also for the approaches and terminal stations at both ends, without which the bridge would be of no use.

The large passenger station, in New York City, to be located in the most central part of it, is for two decks, accommodating together thirty tracks, 1,000 feet long. This arrangement has been chosen on account of the very costly right-of-way, which makes it advisable to use height, rather than width for obtaining the required room. The track-platforms will be reached by stairways and numerous elevators at about the same height as the present elevated-railroad stations.

The approaches will be on iron viaducts of the most solid construction, with buckle-plate floors and stone ballast, and partly they will be (for the portion next to the station) on stone arch-viaducts, similarly to those for the East River Bridge. On the New Jersey side, the approach will begin from the meadows between the Hackensack River and Bergen Hill. This latter ridge will be crossed in an open cut, ninety feet wide. The stone quarried out of this cut will not be sufficient by one-half to furnish the concrete material for the tower foundations and anchorages, which are both to be faced with granite masonry.

It will be seen, then, that there is other large work to be done besides building the bridge, and an idea of the cost can be obtained from the following estimate:

The North River Bridge including the anchorages 6500 feet long.	$15,000,000
The approaches of stone and iron and the connecting railroad switch-yards, engine-houses, the grand Terminal Station Building and appurtenances.	11,000,000
Right-of-way, interest during construction and incidentals.	14,000,000
Total cost.	$40,000,000

Great as is this cost, it is fully justified by the traffic in sight, without increase of the present rates. But the undertaking is feasible only when all the railroads can cross over; for not one of them, even the great Pennsylvania Railroad, could build the bridge and terminal improvements single-handed, because for the financial burden assumed, itwould certainly, by law, be obliged to let the other railroads cross over on the same terms.

There are nearly 900 trains arriving and departing every day from the terminal stations in New Jersey, opposite New York City, with nearly 50,000 passengers.

This travel is growing all the time, and by the time the bridge will be finished (say ten years) the traffic will have doubled in anticipation of its completion.

The experience with the Broad Street Station of the Pennsylvania Railroad in Philadelphia, with the Brooklyn Bridge, with the elevated railroads in New York, with all of them, was that the most liberal estimates of probable traffic were largely exceeded, and that it keeps growing steadily to unforeseen proportions.

This points out the necessity of providing on the largest scale attainable, in the plans for the bridge and the terminal station, for a traffic, than which a larger and more important will not be in any part of the Old or New World.

No other engineering project was ever proposed of such great merit at its inception, and so carefully studied in its preliminary stage, nor of so great and pressing necessity.

Mere figures would not give an adequate impression of the gigantic work, but some idea of it can be obtained from a comparison with the great East River Bridge, as will be seen from the following data:

	Brooklyn Bridge.	North River Bridge.
Length including anchorages.	3700 ft.	6500 ft.
Height of anchorages.	85 ft.	210 ft.
Weight of each anchorage.	60,000 tons.	660,000 tons.
Length of each land span.	930 ft.	1500 ft.
Length of middle span.	1600 ft.	2850 ft.
Size of towers at high-water mark.	140 ft. x 59 ft.	340 ft. x 180 ft.
Height of towers from high water.	272 ft.	509 ft.
Height of tower from the deepest foundation to top.	350 ft.	690 ft.
Width of bridge.	85 ft.	86 ft.
Height above high water.	135 ft.	155 ft.
Number of cables.	4	4
Length of one cable.	3580 ft.	6100 ft.
Finished diameter of cable.	15½ in.	48 in.
Number of railroad tracks.	two.	six to ten.
Grade on bridge.	3½ per cent.	1 5-10 per cent.
Weight of iron and steel in the structure.	6750 tons.	42,000 tons.
Allowable speed of trains.	10 miles per hour.	30 miles per hour.
Cost from anchorage to anchorage exclusive of land damages.	$5,600,000	$15,000,000

The North River Bridge will differ from the East River Bridge also in the character of its details.

Thus the anchorages will be accessible in every part through commodious passages and chambers in the interior of the huge anchorage mass. In the East River Bridge the anchors and chains are buried in the masonry, as it was not thought necessary to make them accessible.

The towers of the North River Bridge will be built of steel, forming two half-towers with eight columns each, and strongly braced together to resist the action of tornadoes, which would not affect the structure any more than it would a solid mountain.

The columns will be seven feet in diameter at bottom, and taper to five feet diameter on top. The towers can be erected without false-works. But the greatest difference will be in the arrangement and construction of the cables.

Thus, in the East River Bridge, the cables are placed side by side a certain distance apart, and the required rigidity for the roadway is obtained through six stiffening trusses, also placed side by side.

In the North River Bridge, the cables are placed in pairs above each other fifty feet apart, with the bracing between them, so that they form two arched girders of huge proportions, which are capable of giving very great rigidity to the roadway without the aid of stiffening trusses, and with a great saving of material and weight. But, as an additional precaution for the great concentrated loads of heavy locomotives, there is under each of these arch-girders a stiffening truss, two in all, which, will also aid in resisting the effect of tornadoes, in combination with the wind-cables: these are four in number, placed on top and below these stiffening girders; each wind-cable has a diameter of sixteen inches, or larger than the diameter of the East River main cables.

In this way the required rigidity for fast trains is obtained with the least possible weight of the suspended structure. In no other way can it be obtained with an equal economy of material and cost. It will be admitted that a bridge over which trains would have to run slowly would be inadequate for the expected traffic, and would be behind the age. The regular working speed over the bridge is to be thirty miles per hour, a speed which never could safely — be attempted on a long submarine-tunnel, built through mud and sand.

While in the Brooklyn Bridge the cables are compacted and closely wrapped with wire into a solid cylindrical shape, in the North River Bridge the cables will be also compacted into a cylindrical shape, but will be covered with a solid sheet-mantle or steel envelope, leaving an air-space of two inches all around the wires for the double purpose of protecting the cables against uneven temperature effects and against the weather. The water will be more thoroughly and certainly excluded by the solid sheet covering than can be the case with wire-wrapping only. The steel-envelopes can be removed for the inspection of the cables, whenever needed. The preservation of the cable is thereby made easier, inasmuch as linseed oil can be applied readily whenever needed, and the wires thoroughly soaked with oil, thus preventing rusting.

The architectural features of the bridge are striking and well considered. The graceful curves of the cables, the simple and strong form of the well-proportioned double-towers, the large-featured architecture of the anchorages, all combine to make the structure grand and harmonious in all its parts without artificial devices or ornamentation.

There is no other known place in the world requiring such a long span-bridge, and it is very probable that a longer span will never be proposed or designed anywhere. The much-talked-of bridge over the English Channel would be 20 miles long and 180 feet high, but the longest spans proposed for it do not exceed 1,800 feet. It is the length of span, and not of the bridge, which taxes the ingenuity of man and the resources of science; for the longest bridge in the world does already exist in the city of New York in its elevated railroad, 33 miles long, as one continuous bridge. But no one would assume that as the greatest achievement in bridge-engineering.

Thus the time has arrived when the manufacturing facilities of the country, its financial prosperity, and the resources of science combine to make the construction of this great work possible, to the certain success of which commercially, as well as from an engineering point of view, we may look with great confidence.

IMPROPER COMMISSIONS.

November 12, 1888.

My Dear Sir, — We have frequently paid brokerage to individual architects of more than $25.00 in a single month. It won't take a minute to read our terms.

To architects who send us orders for Sanitary Parchment Sheathing, to be delivered direct to a builder (who is not a dealer in sheathing) we give five per cent brokerage, on each order, to the architect.

To architects who send us orders for Sanitary Parchment Sheathing, to be shipped by us to dealers or jobbers in sheathing, and to whom we are not already selling, we pay a brokerage of three per cent to the architect on all the dealer buys from us for one (1) year, including the first sale.

Large dealers frequently buy of us several thousand dollars worth of Parchment Sheathing in a single year.

Our trade prices are printed in large bold type on all our samples. The architect's brokerage for his services, does not raise or lower this printed trade price.

Notice. No brokerage paid to any one except he be an architect.

Our Parchment recommends itself; it is the best sheathing made.

It grows hard and metal-like with age.

The hotter the climate the harder it becomes.

It has nail guide lines on its surface to direct carpenters in following the course of beams and timbers to aid them in laying the sheathing uniform and straight. No other sheathing has nail guide lines on.

Yours, etc., M—— P—— and M—— Paper Works.

To the Editors of the American Architect:—

Philadelphia, Pa., November 15, 1888.

Dear Sirs,—I am in receipt of the enclosed this A. M. I consider it a burning shame that we should be compelled to submit to this sort of a thing. The time has come when I, for one, abstain from specifying any certain brands or makes of goods, as far as possible, because of the charge that is likely to be made, that there is a money interest in it. Circulars of this kind fall into other hands.

Statements such as are contained in the first paragraph create the impression that the acceptance of commission, or brokerage, is the usual thing, thereby casting a slur upon the whole profession. There is not an architect in this country worthy of the name who would accept any remuneration from any other than his client, who expects him to secure for him the best materials possible, and supposes the commission he pays him sufficient to enable his architect to decide upon that which is best, uninfluenced by any other considerations. Respectfully, Isaac Pursell.

Philadelphia, Pa., November 15, 1888.

To the Editors of the American Architect:—

Dear Sirs,—The inclosed has just come to hand. Perhaps you would like to give the parties a little free advertising with comments. It is about as plainly worded as any circular of the kind that I have seen. Very truly yours, George C. Mason, Jr.

Philadelphia, Pa., November 15, 1888.

To the Editors of the American Architect:—

Dear Sirs,—I received the inclosed circular to-day and intended to return it with a few *remarks* but, upon a second thought, concluded to send it to you. I think such things should be made odious as soon as possible. Yours truly, Willis G. Hale, *Architect.*

Philadelphia, Pa., November 20, 1888.

To the Editors of the American Architect:—

Dear Sirs,—We submit the inclosed circular for your kind consideration. It seems remarkable to us that the dishonorable practice of "Architects' commissions" should be advanced in such a way as this. Subject to your good judgment, we would suggest that you comment editorially upon this matter.

Yours very truly, Smith & Prichett.

We think it likely that the persons who were indiscreet enough to put their names to the foregoing circular, have credulity robust enough to believe that all of the copies which have not found their way to our office table must have been preserved by architects who are willing to become their pensioners at $25.00 per month, and that consequently their "enterprise" is to be rewarded by a large demand for their goods.

The waste-basket, however, should not be left out of their calculations.

If these people in course of time find themselves nearing bankruptcy and not wealth, we believe that they will be able to trace their disaster to the issuing of this circular, the effect of which must be, and inevitably will be, to cause the entire building community to avoid the material thus advertised. "Good wine needs no bush" and it must be a poor thing, indeed, that cannot find a market except through underhand and disgraceful methods.

The statement made by Mr. Pursell, in the note accompanying one of the many copies of this circular which indignant architects have sent us, that it is becoming his practice to avoid calling for specific articles in his specifications in order that he may avoid even the shadow of a suspicion on his professional good name, shows clearly how manufacturers who believe in the "brokerage" of architects are bringing about a rupture of the relations which should exist between the makers of building supplies and the men who, through their control of so vast an amount of building operations, can increase or diminish their consumption.

Although we emphatically feel that Mr. Pursell's attitude is not the right one — since it may prejudicially affect the interests of his clients — we cannot wonder that he and many others have been forced into it by the actions of dealers and manufacturers. It is one of the few means of defence that an architect has against the common innuendo that he takes a "commission" from the dealers whose goods are mentioned in his specifications, to be able to say that he "never calls for a definite make or brand." An architect who calls for a lock or a window-fixture, a water-closet or an elevator in a generic way, or with simply a stipulation that the cost shall not exceed a given sum, might properly be classed with a physician who should add to the recipe just written for a patient, the recommendation that, if the druggist do not happen to have in stock the drug called for, he may "use any other equally good provided the price does not exceed —— cents per dozen."

On the contrary, that architect does his fullest duty to his client whose specification contains most precise and definite instructions as to brands, makes, styles and qualities of all the materials that are to enter into the construction of the building, and the inclusion of such directions will be understood by honest men to mean, not that the architect will receive "a commission" on the articles enumerated but that he is giving his client the full benefit of his special knowledge — and the possession of such special knowledge is one of the things that make it worth while to employ an architect rather than to undertake to get along without him.

Some architects abstain from mentioning special goods, because they do not feel sure that some of the latest inventions, which they have not yet had time to investigate, are not the best to use; but it is better to call for a fixture that will surely perform the required service, even if a little old fashioned, than to leave it to the selection of a builder whose chief aim may be immediate gain rather than lasting good repute.

Boycotting, even in the mild and negative form adopted by those who feel with Mr. Pursell, is to be deprecated, and architects should still use in the fullest degree their special knowledge of building matters in the true interest of their clients, even if they are so unlucky as to have clients who can be brought to believe that the written evidence of care and thought contained in a thorough and complete specification is merely proof of fraud being perpetrated upon themselves.

In refreshing contrast to the course adopted by those who feel that architects possess but little moral balance is that pursued by such men as Mr. Merchant, of Philadelphia, who has been known to travel forty miles or so to make a contractor apologize, on the works, for the statement that Merchant had paid the architect a commission in order to secure the introduction of his goods.

EQUESTRIAN MONUMENTS.[1] — XI.

LEADEN STATUES, DESTROYED.

A Crockery Statuette of Boy and Pony. By a follower of Palissy.

The most commonly used material from which to make equestrian statues was bronze, at once the most imperishable and capable of taking on only less of delicacy than the most perfect of fine-grained statuary marble, which was used next in the order of frequency. Other materials have also been used, iron once or twice, wood occasionally, brass also, but more often than these lead, which, from its cheapness, low degree of fusibility and ease of working was, at one time, a favorite medium. Naturally, this material was most often employed by the least artistic and most mercantile of nations — the English, who, however, although they appreciated the economy with which they could satisfy the fashionable cravings for artistic surroundings, which were imported by returned travellers who had made the tour of the Continent, yet were themselves obliged to lean upon the greater skill of foreign artists whom chance had brought into the kingdom. After the Restoration, and in the early days of the Hanoverian House, the impulse given to art by those who, during the Commonwealth, had sojourned in France or who had followed in the train of the imported German court, was not inconsiderable, and it was more possible to meet its demands by entrusting the work to those already skilled, than to try to discover and foster native talent. But, as these would-be patrons of art were English, the desire of obtaining the most show for the least money was omnipotent, the virtues of lead were appreciated as never before, and an "art industry" of no small dimensions sprang up to meet the demand. At one time, there were in Piccadilly, several shops — hardly to be called either studios or *ateliers* — employing many hands in the production of leaden statuary, which was either made to order for, or purchased ready-made by, the wealthy nobles for the adornment of their country seats and parks, or for setting up in the public places of large cities.

Chief amongst these workers in lead were Van Ost (or Nost), probably a Dutchman, and his pupil Charpentière, who had probably practised their art in Holland, where every householder's ambition was to have his yard or garden a perfect curiosity-shop of ingenuity and misapplied art, — where a painted wooden or leaden statue in the midst of a bit of shrubbery was almost a matter of course. The leading patron of these men were James Brydges, who, like the great Marlborough, made his fortune during the wars of Queen Anne by the peculiar ingenuity with which he handled, for his own benefit, the money which, as paymaster of the troops, he was supposed to dispense for the pay and maintenance of those who bore arms. Created Duke of Chandos, Brydges set about spending with a most lavish hand the wealth he had secured, and as a first step set about building a mansion suited to his present magnificence — not only one house but two, a town-house in Cavendish Square, and a country-seat at Edgeware, three miles or so distant. To this last was given the name of Canons, and the architect, James Gibbs, and his assistants made of it, between 1715 and the death of the Duke in 1744, a very successful palace, in the Classic style adopted by Palladio. It was the

[1] Continued from page 244, No. 672.

ambition of the owner to acquire all the land lying between his town-house and Canons, and in pursuit of this vast sums were expended, all to satisfy the Duke's ambition to be able to say that when he went down from London to his country-seat he rode only through his own estate. Not only was the palace magnificent, but the surrounding park was laid out in conformity with the best advice of trained landscape-gardeners, and here, as well as about and in the buildings, statuary was introduced without stint. Most of these statues were presumably of lead, and the work of Van Ost and his followers. Amongst these statues was a gilded leaden equestrian statue of George I, the horse modelled on that by Le Sueur for the statue of Charles I, at Charing Cross, and the King arrayed in Classic drapery. This statue was thought by Henry, second Duke of Chandos, good enough, when Canons was dismantled about 1747, to be brought to London and set up in Leicester Square, in November, 1748, where, owing to an uncertainty as to the ownership of the Square and its surroundings, it, together with the buildings, fell during the prolonged litigation into decrepitude and decay. From a fashionable quarter the Square passed through the phases of shabby gentility to something worse, and each succeeding stratum of society treated the leaden effigy with less of respect than did its predecessors. It was, apparently, no one's business to see that the King and his steed had an occasional coat of gilding, or even paint, though in 1812 it was regilded. Long years of exposure had their natural effect and persistent oxidation caused the group to gradually drop to pieces — now and then propped up temporarily by some more careful hand which, like enough, may have been raised to drive away the obnoxious small-boy of the neighborhood, who had at length so far mastered the traditional veneration for royalty as to consider the august alien as a mere cockshy, and with stick and stone and broken bottle helped on the work of time. At length George dismounted with little of royal grace, one leg falling to one side, the other on the opposite, and for a time lay beneath the belly of his horse, till at length his carcass was probably sold for old junk. For a time the riderless steed, broken-kneed and foundered, stood alone, a decrepit and meaningless wreck, which was at length concealed from view by a great model of the globe which was built about it, and covered it from sight between 1851 and 1861. In 1865 the Metropolitan Board of Works assumed possession of the Square, and finally, in 1874, Baron Albert Grant bought the place, rejuvenated it entirely, and deeded it afresh to the Board of Public Works as a public pleasure-ground for the people. During these changes the last relics of the monument disappeared.

Too late to make use of it, a photograph of the statue has been found which shows the horse spotted with paint by some local genius after the manner of the rocking-horses of our nursery days, while George, *sans* feet and legs, is crowned with a fool's cap and armed with a broom in place of sceptre, and an attempt has been made to revive the memory of the regal character of the group by binding upon the forehead of the horse — propped up in front, but as to his haunches allowed to droop towards the ground — a horn of portentous size, thus converting him for the nonce into the national unicorn. Grouped about the battered base the photograph shows a score of boys all on the broad grin, some one of whom was probably the leading spirit in carrying out this piece of insular wit.

Another equestrian statue of the same monarch, also by Van Ost, is mentioned as having been set up in Grosvenor Square in 1726 by Sir Richard Grosvenor, and as it, too, was of lead and represented a not too popular sovereign, it is small wonder that it was hewn limb from limb not long after it was put up.

Though set up in turbulent Cork where one would think the statue of a Protestant king would not be likely to have a prolonged existence, the equestrian statue of George II placed on the Parade survived for nearly one hundred years; but it, too, at length disappeared between two days, though it was at length found in the river where some laborious party, inspired by spite, playfulness or artistic disgust, had taken the trouble to deposit it.

Still another leaden equestrian statue — which has a peculiar interest for Americans — is known to have disappeared. The Princess Amelia caused an equestrian statue of her father in the character of Marcus Aurelius, to be executed by Beaupré under the supervision of Joseph Wilton, R. A., and placed in Berkeley Square. This statue, of indeterminate but probably mediocre merit, is of much interest to us since it is the original of the first equestrian statue that was erected in this country, unless perchance it was the original itself and not a duplicate that on August 21, 1770, was set up in the Bowling Green in New York City; but this is not likely seeing that lead statues were to be had so cheap. As might be supposed the statue, set up in a time when the revolutionary ferment had already began to work, was received with scant applause from the citizens who, before long, began to inflict upon it those indignities to which its base companions had already been subjected in England. But mere provincials were not to be allowed to insult the King's majesty unrebuked, and in 1773 an edict was decreed that any one caught defacing the statue should forfeit £500 or endure a year's imprisonment. How great damage had been done before the night of July 9, 1776, no one can tell and it does not much matter, for that night saw the destruction of the first equestrian erected in this country. Enflamed by the reading of the Declaration of Independence, the news of the signing of which had but just arrived from Philadelphia, a party of forty picked men under the leadership of Captain Oliver Brown, afterwards an artillery officer of the Revolutionary army, fixed ropes around the King's neck and the group was pulled to the ground and cut to pieces. The (supposed) mane and tail of the horse and the cap of the pedestal, — after serving both as tombstone and doorstep — are now in the rooms of the New York Historical Society. The greater part of the statue was sent to Litchfield, Conn., where the loyal ladies of the town melted it down and from it cast 42,000 bullets, many a one of which doubtless found a billet in English or Tory supporter of the original. Of the fate of the head of the king the *Magazine of American History* says that "Colonel Montresor tells a curious story of the fate of the head of his Majesty's statue that was pulled down by the Liberty Boys at Bowling Green, New York, in July, 1776. 'Hearing,' he writes, 'that the rebels had cut the King's head off the equestrian statue (in the centre of the Ellipps, near the Fort) at New York, which represented George the Third in the figure of Marcus Aurelius, and that they had cut the nose off, clipt the laurels that were wreathed round his head, and drove a musket bullet part of the way through his head, and otherwise disfigured it, and that it was carried to Moore's Tavern, adjoining Fort Washington on New York Island, in order to be fixed on a spike on the truck of the flag-staff as soon as it could be got ready — I immediately sent Corby through the Rebel Camp in the beginning of September, 1776, to Cox who kept the Tavern at King's to steal it from thence, and to bury it, which was effected, and was dug up on our arrival, and I rewarded the men, and sent the head by the Lady Gage to Lord Townshend in order to convince them at home of the infamous disposition of the ungrateful people of this distressed country.'" — (Evelyn's "*In America.*")

The House of Hanover is nothing if not clannish, and it is strange that more was not done by the family to preserve the statues of the

Leicester Square!!! A-rt-n the (B) Ædile. "Ha! Now that's a style of art I flatter myself I really do understand!" — *Punch.*

Georges, which, if Thackeray may be believed, could hardly have been less attractive than their originals. Thackeray found so much matter for his satire in the lives and characters of the originals that he seems not to have thought it worth while to fling a passing gibe at these leaden monstrosities, but in a "Small-Beer Chronicle" in his "*Roundabout Papers*" he pays his respects to another of the family, William, Duke of Cumberland, son of George II:

"Look at William, Duke of Cumberland, with his hat cocked over his eye, prancing behind Lord George[1] on his Roman-nosed charger; he, depend on it, would be for getting off his horse if he had the permission. He did not hesitate about trifles, as we know, but he was a very truth-telling and honorable soldier: and as for heroic rank and statuesque dignity, I would wager a dozen of '20 port against a bottle of pure and sound Bordeaux, at 18*s.* per dozen (bottles included), that he never would think of claiming any such absurd distinction."

As in the case of his father, whose horse ran away with him at the battle of Dettingen, after which episode he dismounted and fought afoot, there was some appropriateness in representing William on horseback, for he was a soldier of considerable ability, but of uncontrolled ferocity, which earned for him the soubriquet of the "Butcher of Culloden," because of the atrocities he visited on the followers of the Pretender after that disastrous battle. In his "*History of London*," Knight makes a plea for the preservation of this statue in these words:

[1] Bentinck statue in the same Square.

"When that purification of our public statues, which there is so much reason to hope for, shall take place, and none be left standing that do not fulfil the conditions which morality and art are alike interested in demanding from the men whose effigies are to adorn our high places, we trust one exception may be made—the Duke of Cumberland's statue. Let not that be destroyed; keep it, if it be but to inscribe on it, for the good of the people, the people's own short summary of his character, and thus leave it to posterity. Who shall say what suffering and disgrace may not be spared in future wars, if wars there must be, by so decisive and permanent an expression of a sound public feeling?"

This statue, which by some is said to have been of richly-gilt lead, and by others to have been executed in marble by Cheere, was set up in Cavendish Square, London, in 1770, by Lieutenant-General William Strode in acknowledgment of benefits received at his hand; and, though generally considered a poor piece of work, was interesting because the Duke was shown in the full military costume of the period, and not in Classic undress. The group was either destroyed or removed a few years ago only.

George I.—Born 1660. Ascended the throne of England, the first King of the Hanoverian line, in 1714. Died 1727.

George II.—Son of George I. Born in 1683. Ascended the throne, 1727; Died in 1760.

George III.—Grandson of George II. Born 1738. Ascended the throne in 1760: died 1820. Imbecile during the last ten years of his life, so that the Government was placed in the hands of the Prince of Wales [George IV] as regent.

William, Duke of Cumberland.—Son of George II (1721-1765). ("The Bloody Butcher," so called from his cruelties in suppressing the rebellion incited by the Young Pretender in 1745.) A brave soldier but an unfortunate one. Fought at Dittingen. Defeated the Scotch at the battle of Culloden, 1746. Defeated at Fontenoy, Laffeld and Hassenbeck.

The Statue of George I.—"*Old and New London*" says the statue was modelled by C. Buchard and was regilt in 1812. Timbs's "*Curiosities of London*" also ascribes it to Buchard. It was purchased by the inhabitants of the Square.

Canons.—Built by James Brydges, Esq., afterwards Duke of Chandos. Chandos, commonly called the "grand Duke," was a liberal man and the patron of Pope, Hogarth and Handel. The former wrote some well-known lines on Canons, which he termed "Timon's Villa," in his "Epistle on False Taste," addressed to Richard Boyle, Earl of Burlington, and Hogarth introduced Pope, as a whitewasher on a scaffold, bespattering the magnificent Duke of Canons, in his satirical print, "The Man of Taste." Canons cost between £200,000 and a quarter of a million. It was quite a wonder of its age; but in 1747 the family, having lost heavily by the South Sea Bubble and being cramped with the enormous expense incurred in buying so much land (between the town and country mansions), was forced to break up and sell the house. The [pedestrian] statue of George II in Golden Square, London, came from Canons.

George II, Golden Square.—Knight's "*London*," speaking of the pedestrian statue of George II (as a Roman warrior) in Golden Square, which came from Canons, says that at the sale "a gentleman, an acquaintance of the auctioneer, came in, and catching his eye, nodded in token of friendly remembrance. 'Thank you, Sir,' was the immediate comment—down went the hammer—'The statue of that excellent monarch is yours.' What could the possessor do with such an immense piece of sculpture but give it to the public?"

"Leaden Statuary.—In imitation of the French and Dutch gardens there were few of those in the vicinity of London or in the provinces, the squares or oblong grass plots of which were not embellished by correspondent images, but of pastoral and domestic characters, and rarely borrowed from the heathen myth. The lead has been long since converted to useful purposes. When the demand for them was so great, the trade of making them was very lucrative. A story is told of a Dorsetshire gentleman, whose father had brought two antique marble statues from Italy. Upon his marriage with a city dame, who was determined upon modernizing his old family seat, she ordered that these unfortunate statues should be painted, in order that they should *look like lead*. But Van Ost (or Nost) was an artist capable of much better things; and was probably induced by profit to undertake such mean subjects; or, to superintend the manufactory."—From note by Dallaway to Walpole's "*Anecdotes of Painting in England*."

"Statues in lead or mixed metal, after the Dutch taste, were all the rage then, and the makers of these works—often clever designers—drove a roaring trade. Piccadilly was full of their yards."—From Tom Taylor's "*Leicester Square*."

Charpentiere, "A statuary much employed by the Duke of Chandos at Canons, was for some years principal assistant to Van Ost, an artist of whom I have found no memorials, and afterwards set up for himself. Towards the end of his life he kept a manufacture of leaden statues in Piccadilly, and died in 1737, age above 60."—From Walpole's "*Anecdotes of Painting in England*."

The New York Statue of George III.—In a book of general orders issued by Washington in 1776, under date of July 10, it is said, "Tho' the General doubts not the persons who pulled down and mutilated the statue in Broadway last night, acted in the public cause, yet it has so much the appearance of riot and want of order in the army, that he disapproves the manner and directs that in future these things shall be avoided by the soldiery and left to be executed by proper authority."

Sir Henry Cheere.—[1703-1781.] Pupil of Schumakers. Made monuments to Admiral Hardy, Archbishop Boulter and others in Westminster Abbey. Master of Roubilliac.

[To be continued.]

The Finish of Yellow Pine.—A yellow pine dealer from Alabama says that it will not do to apply oil to that wood in the finishing process. A shellac filling, and a subsequent application of shellac varnish is the proper treatment according to this authority. He says that oil causes the wood to turn a dark and disagreeble color, which is precisely opposite to the natural appearance of yellow pine, which is bright and cheerful. This Alabama man's opinion is not indorsed by some of the dealers and wood-workers of this city. Yellow pine is often finished in oil here and thus treated is considered richer and handsomer than when finished with shellac varnish only. It is true that oil gives a darker appearance to the wood, but its richness and tone is thereby secured, and that staring, vulgar, cheap appearance, that is sometimes alleged of yellow pine is obviated. It is all a matter of taste. You can finish your yellow pine in oil or shellac, and have a handsome effect in either case.—*Northwestern Lumberman.*

MEDIÆVAL HOUSES.[1]—VII.

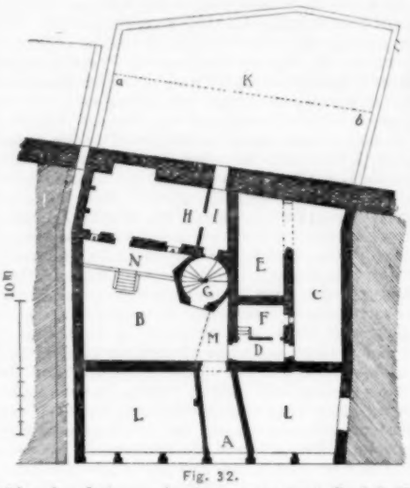

Fig. 32.

In several of the then flourishing cities of the south, now little known, there still exist dwellings of the thirteenth and fourteenth centuries which combine the features of hôtel and ordinary house. The rich merchants of these municipalities on the borders of the Garronne, the Aveyron, the Tarn and the Lot, in whose breasts the Gallo-Romanic traditions had been deeply implanted, built their hôtels with shops on the street, either for their own business or to rent. Such buildings were frequent at Toulouse, Alby Saint-Antonin, Cordes, Gaillac and Villeneuve-d'Agen.

Figure 32 is the plan of one of them in the main street of the town of Cordes, overlooking the promenade of the "Bride." At the right and left of the entrance *A* are the stores or stalls opening on the street. At *B* is the principal court, and at *C* a small court reached by the passage *D*. The open room *E* served probably as a stable. *F* is a store-room. A large spiral staircase *G* gives entrance to the great *salon* of the lower floor *H* raised seven steps above the ground of the court. A passage *I* communicates with a garden *K* situated outside the old ramparts against which the hotel is set. Buildings of a more recent date have been constructed over the garden from *a* to *b*. The stores *L L* had no access to the court, and probably those who occupied them lodged elsewhere, at least when these stores were not used by the proprietor of the hotel. The great staircase *G* leads in the upper story into a room situated over the *salon H*, and communicating by a wooden passageway *M* with the rooms in front, which are only divided by partitions. There is a second story above these front rooms, reached by the great staircase and a second passage. The stable and store-room were on the ground-floor. A little terrace, *N*, with steps, descends to the court from the front of the *salon H*. This dwelling, which dates from the first years of the fourteenth century, is typical of the hôtel of the Middle Ages. Stores opened on the street, and the lodgings were in the front rooms of the first and second stories. The remains found of hôtels of the thirteenth and fourteenth centuries in the northern towns are not complete enough to indicate the plans of those dwellings. We will only state that they contained courts with porticos on one or two sides, a number of retired rooms opening on the courts or gardens, and common rooms placed in the neighborhood of the street.

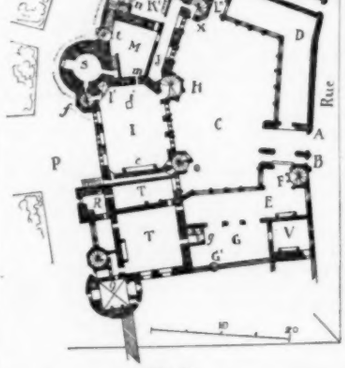

Fig. 33.

The most ancient edifice of this kind still existing is the Hôtel of Jacques Cœur, at Bourges. This splendid dwelling was built on the old wall surrounding the town, which Jacques Cœur owned under a fief. The plan of the ground-floor is shown in Figure 33. The towers *R*, *S*, *Q*, formed part of the ramparts of the town and were in condition to be utilized. *S* was crowned by a rich battlemented pavillion, and a staircase gave access to it as in the tower *Q*. The rampart upon which the front wall was laid formed a very obtuse angle, and obliged the architect to give to his buildings the irregular shape which we observe upon the court; in those days they thought less of symmetrical combinations, and they profited by the accidents of the ground as much as possible.

The entrance to the hôtel, on the street at *A*, has a porte-cochère with a postern *B* at the side; the staircase *F* leads to the chapel

[1] Translated from the French of Viollet-le-Duc, by Mr. A. B. Bibb. Continued from page 247, No. 674.

situated above the entrance. From the outside it was thus easy to reach the chapel without going into the interior of the house. From the entrance *A* for carriages or horseback-riders, and from the postern *B* the great court *C* is reached, and the walled porticos *D* and *E*. The latter portico was lighted by the court *G*, having a well at *G'*. At *H* is the great stairway giving entrance on the ground-floor to a large dining-room *I* and to a passage *J*, communicating with the kitchens at *K* and *K'*. The kitchen *K'* had an oven, a fireplace and a cooking-stove. From the street there was a direct entrance into the kitchens through the passage *L* and the servants' small court *L'*, communicating with the great court by the passage *L''*.

The great dining-room, heated by an immense fireplace *C*, had a small gallery for musicians who reached the gallery without passing through the dining-hall by a staircase *f*. On the floor of the dining-hall a trap-door opens into the cellars. Whether this trap was intended for the use of the butler, who could thus have fresh wine brought in during the repast, or whether it was intended, as some think, to allow the silver to be quietly thrown into the cellar in case of fire, is not quite clear. The great fireplace *C*, with an opening of six metres, was richly decorated, its mantel showing a fortified town and its sides two nude statues of Adam and Eve, separated by the tree of knowledge. *M* was a pantry from which by the opening *m* the dressed-dishes could be passed into the dining-room. The small, straight stairway in this pantry descends to the lower story of the tower *S*, which served as an annex to the pantry. Opening out of the small kitchen *K*, and below the bake-house, is a vaulted wash-room fed by pipes from a hidden well. Latrines for the servants were placed at the side of this wash-room under the masonry of the staircase. A stairway *n*, puts the kitchen in communication with an entresol of the tower *S*, and the first story is gained by the spiral stair *t*.

The little court *L'* has a beautiful well, fitted with pipes which supply the reservoirs in the large kitchen, *K*. From the kitchens the meats were carried into the pantry through the passage, *J*, by a private door under the great staircase *H*. Under the staircase, *O*, is a passage which puts the great court into direct communication with the Place de Berri, *P*. At *T*, *T'*, are two large rooms, whose use is not known, but which seem from their arrangement to have been used as chambers, with wardrobes in the square tower, *R*. All this angle, including the tower, *Q*, constitutes a complete independent apartment, whence one could, from the great chamber, *T''*, descend to the small court, *G*, by the staircase, *g*, or mount to the upper stories. The conciergerie was at *V*, and the gallery, *D*, served as a place of reunion for the poor, to whom the remnants of the feast from the table of Jacques Cœur were distributed. The poor had no access into the hôtel, but could wait under shelter until they received from the kitchen what was saved for them. The staircases *X*, *H*, *O*, *g*, ascend from the ground to the upper floors.

This plan is irregular and of great extent. Each department has its own place and is independent of the rest, while communication between them all is easy. At the right of entrance, the culinary department has its court, its own entrance and its large portico for the distribution of alms. In the front is the principal staircase for the upper apartments and the dining-hall of the ground-floor. At the left is a complete independent apartment with its own court and portico, allowing the occupant to go in and out in privacy.

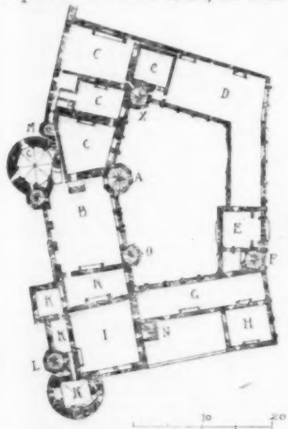

Fig. 34.

Few of the hôtels of the seventeenth century can boast arrangements so commodious and well studied. Figure 34 is the plan of the first floor of Jacques Cœur's house. The principal staircase, *A*, gives entrance to the great *salon*, *B*, which has a stage or platform like the great *salons* of the châteaux. The living-rooms were at *C*. They communicated with the great *salon*, *B*, and with the gallery, *D*, by side passages and direct entrances. From the gallery, *D*, the chapel, *E*, was entered, and it could also be reached directly from the lower floor by the staircase, *F*. Another gallery, *G*, joined the chapel, and the *salon*, *I*, and the separate apartment, *K*, which had a private staircase, *L*. The principal apartment, *C*, is reached by the staircases, *M* or *X*. The *salon*, *I*, has an exit by the stairway, *N*, the great *salon*, *B*, itself beside the grand staircase, having a second stair at *O*.

On the first story, as on the ground-floor, the different departments of this hôtel were independent, so that the rooms for reception did not encroach upon the private life of the inmates. As in the châteaux, the programme was one of complicated requirements. It is certain that these numerous and dissimilar arrangements seemed indispensable, and that they sacrificed all idea of symmetry to the necessities of the dwelling as they then comprehended them. It will be observed that the living-rooms, aside from the great apartments, were supplemented by numerous closets and wardrobes, which could not have been very large and that all these apartments great and small, were lighted.

Jacques Cœur, in utilizing the Gallo-Romanic towers of the ramparts had not, perhaps, been sorry to give to his hôtel the appearance of a feudal domain, and the preservation of these towers necessitated the irregularities of the plan. The architecture was adapted, however, to this lack of symmetry, and nothing is more picturesque, more brilliant, than the interior of the court, with its stair-towers and many roofs, surmounted by chimney-tops, spikes, dormers and leaden ridges decorated and painted. We give at Figure 35 a bird's-eye view of this hôtel taken from the point *P'* in the plan of the ground-

Fig. 35.

floor. The construction was treated with extreme care, and the carving is charming in style and appropriate to each division. The sculptures include many devices of hearts, feathers, shells, etc. In the groups over the three arches of the chapel staircase, the sculptor has placed a priest dressed in his robes blessing the water; behind him a young priest who rings for mass, while in the background comes a beggar on his crutch, symbolic of the accessibility of the holy rite to all. The second bas-relief represents priests dressing the altar. In the third, women come to confession preceded by a child, who opens the door. At the top of the stairway is a fourth bas-relief, representing the Eternal Father with two adoring angels. Above the door of the stairway on the kitchen side is carved a large fireplace, before which roasts a chicken, a child turns the spit, a woman washes dishes, and the cook pounds spice in a mortar. Among the carved or painted devices we read these: "To valiant hearts nothing is impossible." Afterward, the enigmatic words: "*Dieu. faire. taire. de. ma. joie*"; and this: "Into the shut mouth the fly does not enter." Jacques Cœur had adopted for his arms: blue on a fesse of gold, with three shells sable and three hearts gules placed two in chief and one in point.

The vaultings of the chapel were painted; in each of the triangles of the arch is an angel clothed in white, holding a phylactery and relieved against a blue background starred with gold. These paintings are well executed and passably preserved. We know how dearly this celebrated parvenu merchant of the fifteenth century must have paid for such magnificence. The man was, in fact, one of the most remarkable personages of our country, and his dwelling is interesting from all points of view.

(To be continued.)

COMMUNICATIONS

FROST-PROOF MORTAR.

BOSTON, MASS., December 1, 1888.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,—Noticing in to-day's issue of the *Architect* the paragraph about frost-proof mortar, it seemed to me that an experiment made last winter might be of interest to those engaged in building operations: Last winter, it was necessary to lay up some granite piers during the coldest weather, and, as piers were small in section and heavily loaded, it was thought best to use clear Portland cement, so as to avoid unequal settlements that might be caused by shrinkage of lime-mortar. After some preliminary experiments with salted cement-mortar exposed immediately after mixing to temperatures of ten degrees to twenty degrees Fahrenheit, I directed the mason to add eight per cent of rock-salt to water used with the cement; and although during the time that the piers were being laid up the temperature at night was often as low as ten degrees Fahrenheit, in no case was the cement injured so far as could be observed, and even a

thin wash of cement running over face of pier from some of the joints was found, six months later, to adhere so firmly to stone as to be removed with some difficulty when scraped with a knife. The idea, as you know, was one I got from your paper, but until I tried the experiment I did not know whether salt had been used for that purpose in this country, or whether, with the extremely low range of the thermometer, it would prove successful.

Yours, * * *

ARCHITECTURAL SCHOOLS.

ZANESVILLE, O., November 24, 1888.

To the Editors of the American Architect: —

Dear Sirs, — If not too much trouble, will you inform me which school you think the best for a first-class draughtsman to attend in order to fit himself for the profession.

Respectfully yours, Benj. S. Hubbell.

[If you can afford to spend the necessary time, you will find the Architectural Department of Columbia College, New York, the best. — Eds. American Architect.]

NOTES AND CLIPPINGS

Deafness Caused by the Electric Light. — A curious phenomenon was recently related by M. D'Arsonval before the French Academy of Medicine. After gazing for a few seconds on an arc-light of intense brilliancy, he suddenly became deaf, and remained so for nearly an hour and a half. Surprised and somewhat alarmed in the first instance, but reassurred by the disappearance of the symptoms, he repeated the experiment with the same result. When only one eye was exposed to the light no very marked effect was produced. — *Sanitary News.*

Rats and Lead Pipes. — Fully one-half of the unexplained cases of burst or leaking lead pipes, says a St. Louis plumber, are due to rats, and not to flaws in the metal. In a well-cemented basement, with cement floors, etc., as nearly vermin proof as can be, the annoyance from rats is the greatest, as, being unable to find water, they are driven frantic by the sound of it flowing through the pipes, and they proceed to eat their way to it. The aforesaid plumber, much against the interest of his profession, suggests that here is a modest opportunity for the inventor to contrive some coating for the pipe which shall kill the rat before he taps the water. — *Exchange.*

An Exhibition Catalogue, 1851. — A correspondent of our contemporary, *Fairplay*, has unearthed a comic catalogue written in connection with the Great Exhibition of 1851. It certainly is rather entertaining.

I've had a private view of the Exhibition book,
I mean the authorized catalogue, and from it straightway took
The names and numbers of the curious things to see,
And curious you'll say they are, if you'll attend to me.

No. 1's A bucket of water taken from "All's well,"
" 2's The coat that's worn by the Ocean's heavy swell,
" 3's The weight exact of a grain of common sense,
" 4's Some of the tar with which once Israel pitched their tents,
" 5's A pat of butter, made from the cream of a joke,
" 6's The tail of the pig that was got into a poke,
" 7's The gingham queer that Louis Philippe did borrow,
" 8's The saucer with which to match the cup of sorrow,
" 9's The loaf from which the crumb of comfort fell,
" 10's The brush that paints the sign of the times so well,
" 11's The marrow from the bone of contention taken,
" 12's The rasher of the man who saved his bacon,
" 13's The strap that sharpens up the water's edge,
" 14's The apple of the eye of faith, so they allege,
" 15's The two original stools thro' which the chap was floored,
" 16's The soap that washed the captain overboard,
" 17's The nose cut off our noble country's face,
" 18's The naughty gander caught in a wild goose chase,
" 19's A splinter taken from the River Styx,
" 20's From the house that Jack built, twenty bricks,
" 21's The teeth from the Mississippi's mouth,
" 22's A Scotchman who never travelled South,
" 23's Some coins from the change of the moon, in pence,
" 24's A link from the chain of evidence,
" 25's The wheel of fortune, spokes and staves,
" 26's The pen with which Britannia rules the waves,
" 27's The baby's mouth that was born with a silver spoon,
" 28's The swarm of bees that made the honey moon,
" 29's The bow that shot the shaft of ridicule,
" 30's A grammar from adversity's old school,
" 31's The bit of steel that made the Iron Age,
" 32's The livery worn by History's page,
" 33's The rock to manufacture flinty hearts,
" 34's The barb from one of wicked Cupid's darts,
" 35's Some bits of daylight, picked up when morning broke,
" 36's The cork that fits into the bottle of smoke.

I've sung in numbers, and of numbers up to thirty-six;
Success to Albert and the Queen, and all the little Vic's;
With parting directions, my ditty shall be done,
But when you go to see the numbers, look out for number one.

TRADE SURVEY

Neither the national law-makers nor the people will listen to the appeals of railroad-managers to radically modify the Interstate Law, nor will any serious evading of that law be tolerated. The railroad-managers are dancing a sort of preparatory war-dance among themselves, preparatory to the attack upon Congress for such modification of the Interstate Commerce Law as will allow them to cut each other's rates in the old-time way. The law will stand with such modifications as the Commission in its forthcoming report, it is understood, will suggest. The much-talked-of scheme for concentrating almost one-half of the railway system of the United States into practically one, is neither practicable nor reasonable, and is not in accordance with the spirit of the law, or with the instincts of public sentiment which is behind the law. The difficulties of the railway-managers, whatever they may be, must be fought out upon the present line, and the people will accept the opinion of the Railway Commissioners, that by honesty of purpose and energy all obstacles can be removed. The Bessemer steel-rail capacity has been so much increased within the past year, that the managers of that vast interest have been unable to establish harmony on quotations for the business of the ensuing season. About 50,000 tons of rails have been sold at below cost; namely, at $26, some say a little less. Eastern makers are endeavoring to establish bottom quotations at $28 to $29, and, in consequence of this uncertainty of prices, a large amount of business that would otherwise be placed is being held back. Nothing new can be safely stated this week concerning railroad-building probabilities next year. Only general considerations can be relied upon to point to the probable constructions of the next year, which will probably foot up 10,000 miles of main track, as against something less than 8,000 miles this year. In financial circles there is every confidence in the continued abundance of currency, and in the paying ability of financial and commercial affairs which are managed with more skill and circumspection now than in years gone by. Money invested failed to pay rent or interest, and there are more opportunities of making money than years ago. Opportunities for investment are still multiplying all over the West and South. An Emigration Convention is to be held next week at Montgomery, Ala., and will be attended by representatives from fourteen Southern and Western States. The purpose is to formulate a scheme by which desirable immigration can be increased from Europe and from the Northern States. One agency for this purpose has been established already by a Chicago concern, and a sort of house-to-house canvass is to be inaugurated in all the larger cities and towns in search of industrious persons in possession of small means, of from $1,000 to $5,000. The recent trip of the Agricultural Commissioner of the State of Alabama into the Northwest, stimulated a great deal of interest among the people of these States, and within the past few weeks several delegations of business men have visited Tennessee and Alabama and Georgia with a view of identifying themselves with the promising possibilities of that locality, to some extent. Enterprising travellers think that there are opportunities for transferring the tide of population from the West to the South, and the railroad-managers, the educators, the manufacturers, the land-owners, the money-lenders and the thinkers of the Southern States are preparing to join hands in some well-directed effort to bring about this very desirable result.

Leading authentic advices from leading builders and architects in States between St. Louis and New York point to the possibility of a more active building season than for years past, although, so far, the expressions of opinion are not numerous enough or exact enough to justify a decided opinion. In New York the season has been backward, but lumber-dealers, mill-men, investors, and architects are now speaking very hopefully of next year. The crisis of unwise building has been reached there, and a reaction is setting in. In Philadelphia the season has been an exceptionally busy and successful one, and builders are already laying plans and buying building sites for an increased activity in building operations next year. In several towns in Pennsylvania, where general industrial pursuits are the chief employment of the people, a great deal of house-building and shop-building will be done: notably, Reading, Harrisburgh, and Pittsburgh. Advices from Chicago point to the strong probability of an active year in building, especially for houses and small shops. At Kansas City and some smaller towns in that section of country, a great deal of work will be undertaken in the way of developing the country through which railroads have already been built. Machine-shops, factories, saw-mills, and a multitude of smaller industrial establishments are to be built, and the makers of machinery who have contracts in hand believe that there will be an increased volume of business of this kind between now and spring. The development of coal mines continues to be a very attractive feature of Northwestern enterprise. The development of the coal-bed is equal in its effects now to the discovery of a gold mine ten or twelve years back. For one person then attracted, there are twenty now induced to go thither. There is a demand for machinery for mines and for workers of machinery, house builders and furnishers, and a score of other artificers. While nearly all other producers of wealth have been complaining of slow trade and narrow margins, the producers of anthracite coal have been barely able to meet the pressing requirements that have been coming in upon them from all points of the compass. The production was in round figures, this year, 35,000,000 tons, as against 31,000,000 last year. The bituminous production shows a corresponding increase. One company in Pennsylvania has carried, this year, a million and a half tons of coal and coke more than last. All the railroads in that State have profited by the extensive demand for fuel. The anthracite region are now on three-quarter time. The bituminous mines will run full. The Monongahela region has shut down. The coal regions of the Western States are running as full as ever. The output of natural-gas is increasing, and an offer to control the supply in Western Pennsylvania is now under consideration. Too many interests are to be consulted, and it is not probable that the scheme will succeed. New gas-lines are projected, and a pipe-line from the Lakes to the Ohio River is also under the consideration of capitalists. In a general way, prices are good for all kinds of manufactured products. Manufacturers, themselves, are taking a wise view of the situation, and are endeavoring to guard against an advance, which would restrict the market and create opportunities for shrewder competitors to undersell them. The trusts are endeavoring to take advantage of the crop-scarcity, particularly in sugar, and are buying up the crop in Louisiana, and are looking after agricultural products as well; but, taking it all through, the people are suffering little from combinations of this character.

S. J. Parkhill & Co., Printers, Boston.